MOTOR AGE

Vol. XXX
No. 16

CHICAGO, OCTOBER 19, 1916

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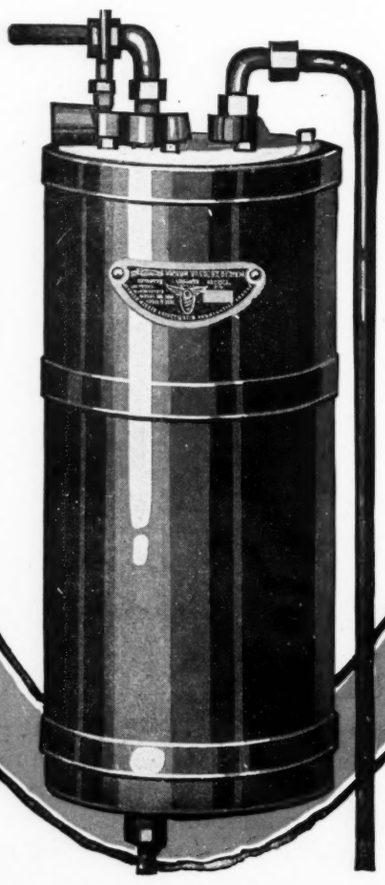

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MOTOR AGE

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ANNOUNCEMENTS

How Alabama and Mississippi have vied with each other to win the Jackson highway routing from Nashville to New Orleans will be a feature of Motor Age for October 26. Putting highway construction on a competitive basis is a new plan but has resulted in great progress. The fascinating points along each route will be told and pictured also.

COMING
Nov. 2
Motor Truck Issue

Motor Age of November 2 will be the annual commercial vehicle number. It will contain complete mechanical specifications of all gasoline and electric trucks on the American market for 1917, together with directory of manufacturers and buyers' guide with prices by which the truck and body type best suited to any special need may be selected.

In addition there will be a comprehensive resumé of the truck industry for the past year, its wonderful expansion, and the causes that have led to it; the effect of the war on the truck industry and the prospect after the war.

This issue of Motor Age will be used as a reference for the year to come. Furthermore, it will offer a material increase in circulation at no increase in advertising rates.

This is an exceptionally valuable issue for gasoline and electric truck manufacturers and manufacturers of truck parts, supplies and accessories. Tell your story in representative space.

Forms close Oct. 30. Make space reservation NOW.

MOTOR AGE
MALLERS BLDG., CHICAGO

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I am selling Studebakers because I thoroughly believe in them. I know them to be the best value on the auto market today. I wanted a car that I could represent without the necessity of assuming an apologetic and explanatory attitude towards my friends and the public in general—in other words, a car of which I could be proud. I wanted this not only for my own peace of mind but for the psychological effect it would have on my selling campaign—for I knew that if I did not respect and was not proud of my car I could not push its sale with whole-hearted zeal, and that my selling campaign would lack in enterprise and punch.

That's the reason I'm selling Studebakers.

James Nixon

Nixon Motor Car Co.,
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Today there are more than 6500 dealers throughout the country who are selling a total of Studebaker cars greater by far than that produced by any manufacturer of medium-priced quality motor cars.

If that isn't an indication of quality, value and superior performance—what is? We've got some interesting dealer facts. Are you interested?

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Detroit, Mich.

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Address all Correspondence to Detroit

Vol. XXX, No. 16 Chicago, October 19, 1916 $3.00 per Year

MOTOR AGE

What Autumn Brings to the Motorist's Wardrobe

As Seen in Company with the Car

by Ruth Sanders

Chance meetings on the road bring their iotas which go to make up the general survey of the autumn offering. When motorist meets motorist and compares notes there is no end to what each may learn. For instance, the three women who have met, as shown in the illustration above, find each other has made a different selection and all are in tune with the season. Brown, green, black, navy and taupe are worn; several coats come in all five colors. The hat shown above is a bonnet effect with shirred crown of roce corded silk and velvet brim with flowered ribbed bow and beaver fur ball on top. Stevens'—$15. The robe on the car in the foreground is from Mandel's—$7.75. It is Scotch plaid of all-wool yarn with plain back

Who is not glad to get this greeting? That is one reason for its showing. The other is the hat

The results of their meeting tell all. The woman to the left, who just at this moment gives us opportunity to view the back of her coat, wears a brown one of velour with large opossum fur collar. Mandel's—$45. The central woman wears a loose plaid coat from the same firm, which has extra size pockets and is only $29.50. The woman at the right also wears a brown velour coat, but it has a Hudson seal collar. Stevens'—$29.50. The two hats to the left are motoring hats with veils. A navy blue and a dove-color emphasize each other. Both are from Mandel's—$15 each. The chauffeur's suit is of gaberdine with pleats on coat. The cap is of the same material. Both from The Hub—Suit, $25; cap, $2.50

AUTUMN has arrived. No longer are the crickets of the roadside true prophets of the coming frost, for frost has come to cotton and to corn and Br'er Cricket as a herald is by no means up-to-date. Indian summer hangs its veil in the trees everywhere you motor. Blue sky seems to run and fade until it reaches earth. Cornfields yawn and pumpkins stare, stripped of all protection corn shocks used to give them from temptation. Pastures still have all their greenness. Trees, though, are just blazing! And the sumac mixes color with prodigal disregard. Makes you wonder if there's fire where you see such haze and color.

But autumn does not bring only crickets, frost and pawpaws, persimmons and bright stricken foliage. The woods are no monopolizers of this idea of changing covering. For, as they renew the spirit of their garments and the yellow pumpkin over be-

yond the fence takes on the aspect of a mocking, grinning goblin, motorists, too, choose new attire for this restful season of the year. Opportunity knocks but once? Perhaps! Then, these are the days for you. Few autumns bring more opportunity to the wardrobe of the motorists, for this autumn's contribution is both varied and exclusive.

Standard colors and standard weaves have been augmented by new colors and new weaves. To our gay garments have come other pansy, amethyst and beet root shades, Burgundys, Bordeaux, Massaux and two new blues the dyers have produced. You will see new fur cloth, duvetyns and Irish friese, each a bit more pleasing than the other.

Designers Are Artists

Yet, in spite of varied and seemingly endless offering, exclusiveness remains, paradoxical as it may appear in view of such great diversity. The war has made little difference in the use of the best material, and the designer who has made up this material is an artist who has the temperament as well as the experience to

But here are two men who have consented to show us other styles. At the left is shown a handsome black coat with large fur collar. Mandel's—$30. To the right is a sweater that any man may need this fall. Hub—$12. Below we see as the center of attraction the coats seen once before in the meeting of the ways. Here we have other views of the three and a veil which can be worn with most any small hat. Veil, Stevens—$4.95. It is 1½ yards long and imported

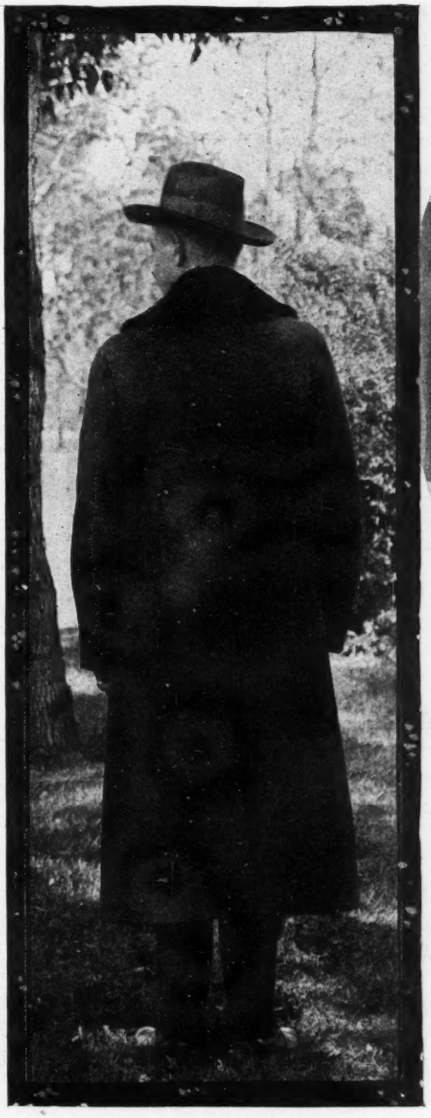
Ah, ha! They caught the camera pointed at them as they were about to start out on a trip, so we have a full face view of some of those who have already appeared in the new costumes. Descriptions appear elsewhere

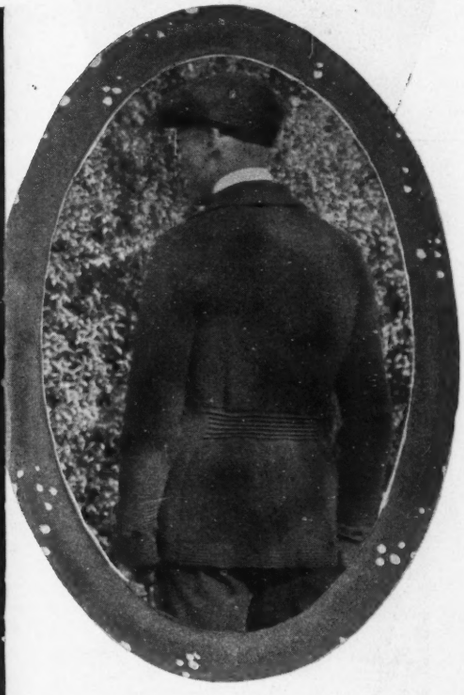
bring out clothing in which good taste predominates.

The autumn will probably have some expense attached to these endless opportunities, for English tweeds and Scotch and Irish homespuns and other foreign weaves vie with each other for room on America-bound vessels. You will be told that this is especially imported; that came from London; this has just been received and is the last shipment of its kind. All too true. But, there is one consolation. So far no coat or hat or bag has been advertised as coming over in the famous submarine, that most expedient of transporters. And American motorists will find a fair sprinkling of foreign-made garments among those from which he chooses, which are in reach of even the average pocketbook.

Motoring Clothes Have Found Favor

Motoring clothes are of rapid growth in popularity. They will become more so, not so much because motorists themselves demand them, but because those garments the motorists naturally select are also desirable from the standpoint of the man or woman who only would motor. Of all the so-called sports, motoring is the most conservative in apparel. No baggy trousers and heavy woollen hose set the motorist on a pinnacle of his own as in the case of the golfer. It is not even necessary for the woman to bind her head up, towel fashion, as if she expected to meet a broom on her motoring travels. He and she are





No, not part of drill, but just other light on the coat and sweater shown on the preceding page. The hang of the coat and the interwoven belt of the sweater would never have shown to such advantage without this notice. The sweater is also a golf coat, form fitting, with convertible collar. It is close fitting at wrists and has inverted belt. Three tones are available. The coat has a heavy Hudson seal collar and a quilted lining, which makes it extra warm

If, perchance, 'tis novelty you wish, here's an example for you. Reindeer coat of a Moca brown color, adding further to the high coat of leather. Hat's new, too. Can be worn turned down as here or not. Coat, Hub—$65. Hat, Mandel's—$10. It is a sports hat of blue with yellow bands and rosette. The brim is flexible

just as likely to motor to a ball or to a dinner as to the backwoods.

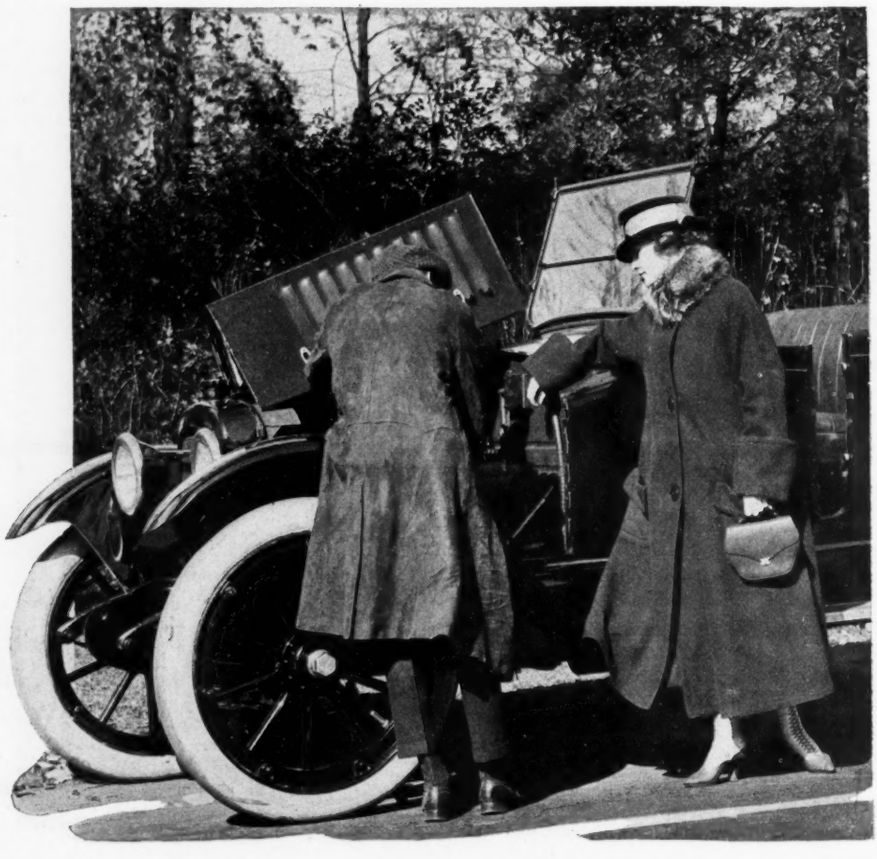
The wide balmacaan the man wore this summer has given way to the form-fitting coat, which is shown in gaberdine, tweeds and homespuns. One Chicago firm also offers a coat of reindeer with Moca collar as an exclusive model for the motorist. The woman is also remembered with a short coat of the same material, which looks well and feels well, besides having the distinction of being something entirely new under the sun. However, do not take me to mean the form-fitting coat has entirely superseded the loose coat. It could hardly do that, for the loose coat with the wide skirt and large pockets has a popularity that does not depend on changing whims of style and fashion.

Woman has, perhaps, the best of it in the coat line. She is particularly fortunate in this respect. More lovely coats are shown this year than she could possibly be able to decide from if she had to choose from all. But a wise providence in the form of a modern store's manager decrees that she shall see only a few—and she usually believes that it is take one of these or do without, what with no others in sight and hearing that each is imported or a special job.

And fur! Talk to me not of fur. If I had an Angora cat, which I am glad to say I have not, I would guard it well, for no telling when the fur of that animal will be called on to supply the deficit in the fur guarantee which somebody must have made Dame Fashion or she wouldn't be so profuse in her use of the same. Fur makes the collar—and the collar is unusually large this year — and forms huge cuffs, sometimes as deep as a small muff would be for the hands. Even the afternoon dress the woman wears under her motoring coat, if she has that kind of appointment at the end of her drive, burdens its fragile self with more pelts of the furry beasties. Even the mole, the rabbit and the weasel are used, while the Angora cat—as I hinted before—is threatened with probable attempts to convert its beauty into that of the blue fox. Poodles, too, are said to be in danger. Perhaps for caracul—I consider the sound only—or wolf—I consider the difference here.

Hats come to match and bear out the color scheme of the coat. Nobby little affairs of velvet compete with fur for favor. Velour also is used extensively. Bead trimming, ribbon and fur hug the narrow brims and just-a-fit crowns closely so that wind may not harm them. Footwear follows the tendency toward dainty style and beautiful color. Scarcity of leather plays no part in the chorus which demands novelty, and more novelty. Two-toned effects give the shoe with black kid vamp and ivory top. Lovely shades of gray, tan and mouse tones make more than one tone unnecessary. Gray buckskin with white tops makes a charming combination. Cloth tops match the coat or dress, and the vamp sometimes is in the same shade.

Oh, yes, when motorists go riding there's no end to the things they may wear.



And while he is demonstrating the inwards or the gas horse, let's be demonstrating what they're wearing, unbeknowst to them maybe. She has a coat of Irish friese, green, of course, and hat of dark green velour trimmed with mustard colored ribbon and bead trim. The collar of the coat is of natural raccoon. The envelope leather bag has an enameled buckle and is from Stevens'—$18. The hat is from the same place—$10. He bends while clothed in Reindeer coat similar to that worn above. Good and warm, a novelty, just what you may want. Woman's coat, Stevens' — $35. Man's, Hub—$65

And here's the woman with the velour coat and opossum collar. See the double belt across the front. Notice the full lines of the skirt. The hat is from Mandel's—$10. It is a sports hat of green with ingrained ribbon, which is also green. Unfortunately, the bag she holds does not show plainly. It is one of Stevens' new imported beaded bags of silk gaberdine. This one is blue with roses—$27.50

Here we go, just in time to show the back of the new Reindeer coat. Man isn't the only one who has the form-fitting coat this autumn. Skirts are full here, but the waist stays close. Furthermore, if you could but see it, there is a pink-flowered silk lining which is enough to make its charm irresistible to most any shopper

Sweaters are not tabooed. In fact, they are rather popular at this time of the year. And they come in silks and silk fibers, as well as in wool. And colors! One wonders whether they are not just a little too loud until one sees them out in the bright light of an Indian summer, perhaps in as bright a toned car, with the road edged with more brightness and a sunny day fairly blueing everything.

You will notice the loose belt, it is so prominent. "Conspicuous" is almost the word, but "conspicuous" and "loud" are too discordant, now that anyone may appear in a strong blue blouse and keen yellow blouse without turning any eyes in that direction. The belt and its buckles also adorn the blouse, and some of the coats have cleverly adopted the fashion of drawing heavy ribbons loosely about the waist and knotting them so that their ends dangle.

The collar is extremely large and may be spread about the shoulders like capes, or set around the neck in flaring mode. One of the newest collars is the shawl collar, which buttons up the front and lies on the shoulders in a manner somewhat similar to that of the cape.

Did I mention the veil Indian summer is so carelessly hanging around in the trees and bushes? I did. Well, the Indian maiden hasn't the only veil, for the hats a woman may safely select for motoring have veils galore. Veils hang from the back of the hat. Veils hang all around the hat. Veils are carelessly draped about the brimless crown with great care and either tucked in underneath with the hair or flung to the four quarters. You can buy your veil attached to your hat, or buy your hat and then get your veil. The style for wearing a veil is particularly obliging. You may suit your own sweet fancy. Short nose veils, chin veils—any of them. In other words, motoring veils, like other motoring clothes, are such through use and not so much through design.

Do not gather from these few paragraphs that the pains of the designer and manufacturer are belittled. Far from it. Rather, you should believe that because designers and manufacturers do take so much pains in making beautiful coats and hats for the men and women who motor, the shoppers as a whole demand the same consideration and what is sauce for one is sauce for the other. Motoring clothes are fast becoming universal clothes. For this reason, what autumn brings to the motorists' wardrobe may be what autumn brings to the universal wardrobe.

EDITOR'S NOTE—The cars are by the courtesy of Harry Newman, Inc., and the Marmon Chicago Co.; the clothes from Mandel Bros., Chas. A. Stevens & Bros. and the Hub, all of Chicago.

Brown-Lipe-Chapin Sold

United Motors Corp. Purchases Leading Differential Gear Concern

Deal in No Way Affects Brown-Lipe Gear Co., Syracuse

NEW YORK, Oct. 16—The Brown-Lipe-Chapin Co., Syracuse, N. Y., largest manufacturer of differential gears in America, has been purchased by the United Motors Corp. and the same policy with regard to the Brown-Lipe-Chapin Co., will be followed as is used by the United Motors Corp., with the several other concerns it has purchased. President Alfred P. Sloane, Jr., of the United Motors Corp., is authority for the statement that the general policy of Brown-Lipe-Chapin will be continued as at present but that the capacity of the plant in the manufacture of differentials will be doubled as soon as additional buildings can be erected. The large resources of the United Motors Corp. will give a broader foundation and scope to the Brown-Lipe-Chapin Co., and it is hoped to be able to manufacture differentials for all concerns needing them. President Sloane's name will be added to the board of directors of Brown-Lipe-Chapin, but H. W. Chapin will continue as general manager as he has in the past.

The purchase of the Brown-Lipe-Chapin Co. does not in any wise involve the Brown-Lipe-Gear Co., of Syracuse, and which to date has been very closely connected with Brown-Lipe-Chapin. The Brown-Lipe Gear Co. is practically controlled by Messrs. Brown and Lipe, both wealthy Syracuse capitalists connected with the Smith Premier Typewriter Co. The connection of these gentlemen with Brown-Lipe-Chapin has been that they have owned approximately one-half of the stock, the remainder being held by C. W. Mott and his General Motors associates.

This latest purchase gives the United Motors Corp. a strong array of seven large progressive manufacturing organizations, each of which is continued as separate manufacturing concerns.

The Dayton Engineering Laboratories occupies seven buildings and has 11 acres of floor space. Last year it produced 142,500 Delco installations and aims at 250,000 for next year. On July 15, 500,000 Delco installations were in use.

The Hyatt Roller Bearing Co. occupies twenty-one buildings, with a total of 900,000 square foot floor area. It employs 5,000 persons and has a daily capacity of 40,000 roller bearings. Over 7,500,000 Hyatt bearings were furnished to the motor car industry in 1916 and it is estimated that 10,000,000 will be furnished for 1917.

The New Departure Mfg. Co. is manufacturing 21,000 bearings per day and by July 1 hopes to have capacity for 30,000 to 35,000 per day. The company is at present operating two factories, the major one at Bristol, Conn., and one for small bearings at Hartford, Conn.

The Remy Electric Co. has a plant of twenty-nine buildings with a floor area of 169,000 square feet or equivalent to 4¾ acres. The present output is 950 ignition systems per day to which must be added 400 generators and 350 starting motors.

The Perlman Rim Corp., a recent incorporation, followed the court decision in the Perlman Rim patent rendered some months ago. The company secured the plant of the Jackson Rim Co., the capacity of which is being doubled, to give a total floor area of 129,400 feet. Some months ago the factory capacity was 2,000 sets of rims or 10,000 individual rims per day. This capacity is being increased.

The Brown-Lipe-Chapin Co., making differentials entirely, employs upwards of 2,000 workmen, and is the largest differential making concern in the world.

Lovell-McConnell Mfg. Co., manufacturers of Klaxon horns, was purchased in September, and plans made to double the production schedule.

Charles Evans Hughes and Mrs. Hughes out for their constitutional

Gas Drops One Cent

Both Standard Oil and Independents Lower Price in Central West

Many Short-Measure Pumps Found in Chicago and Illinois

CHICAGO, Oct. 16—Two matters featured the gasoline situation in the Central West this week, one being a rather general drop in price, and the other, charges of short-measuring pumps. In Chicago, gasoline is selling at 15.6 cents a gallon, which is a drop of 1 cent since the first week in October. The same price prevails at Milwaukee, the Standard Oil being the first to cut the price 1 cent, which was met by the independents.

Reports coming from Bloomington and other Illinois cities, indicate that the price of 15½ cents a gallon is rather general throughout the state. Twin City motorists now have to pay 16½ cents per gallon, whereas they were paying 17½ cents up to October 10.

Approximately half the gasoline pumps that have been inspected in Chicago since June 12 have been condemned, 956 inspections having been made to date.

Results of an investigation of gasoline measuring pumps in Illinois made by the United States Bureau of Standards show that in tests conducted in Chicago and typical suburban and rural communities downstate, the government inspectors found 82 per cent of the Chicago gasoline pumps, and 83 per cent of those outside Chicago, inaccurate. The average shortage was 3.9 cubic inches per gallon in Chicago, and 7 cubic inches per gallon downstate. It is estimated that this shortage means a loss of more than 5,000,000 gallons per year, or $1,000,000, at the present price of gas in Illinois. A tolerance of .1 cubic inch per gallon is allowed.

The Bureau of Standards of the Department of Commerce recently published a report pertaining to the accuracy of liquid measuring pumps in which it says the principal causes of short delivery are the leaks in valves or piping; formation of vapor due to excessive suction lift, or the introduction of air under the pistons; failure to correct for the inertia of a long column of moving liquid; the use of long filling hoses with a low connection at the pump making proper drainage of hose an impossibility; operation of pump at less than full stroke, and slippage past valves and pistons.

GASOLINE STANDARDIZATION

Washington, D. C., Oct. 16—In view of the fact that statements have appeared to the effect that the Bureau of Standards will formulate a test which may be applied by any purchasers to detect at once an inferior product, the bureau has found it

necessary to correct any false impression that may have been aroused and to add a brief summary of the situation.

In the first place, no such simple test is known in the present state of the science of petroleum technology. In the early days of the petroleum industry, when all gasolines, kerosenes, fuel oils, and lubricating oils were derived from one source, viz., Pennsylvania crude petroleum, a simple measurement of the specific gravity, or what amounts to the same thing, the Baume number, by means of a hydrometer, served as a fairly reliable indication of the qualities of these products. Today, however, the specific gravity test is practically worthless as a check on the suitability of a gasoline, for example, for a given motor equipment.

The reason why this is so is that many new oil fields have been opened up in recent years that yield petroleums of very different physical and chemical properties and new methods of manufacture have been introduced that yield products having very different properties in no way related to the specific gravities. The problem is an extremely complicated one, and presupposes a definition of gasoline.

It is highly probable that the specification or definition of standard gasoline and the tests that will be necessary to determine whether the gasoline complies with the specifications will be quite complicated and will require the services of a trained chemist to make them. It seems most probable that the definition of gasoline will have to be based on the percentage that distills over between specified temperatures, when the distillation is carried out under specified conditions. This distillation test, speaking in non-technical terms, is a measure of the freedom with which the gasoline will vaporize. The gasoline must not vaporize too freely for two reasons, one that it would not be safe, and secondly, its loss in storage by evaporation would be too great. Hence, the specification may have to contain limitations of the percentage distilling over below a certain temperature, coupled, perhaps, with a proviso that certain percentages shall distill over below other fixed temperatures, in order that requisite amounts of low-boiling constituents shall be present to insure easy starting of an engine.

ASCOT PREPARES FOR CROWD

Los Angeles, Cal., Oct. 14—With the possibility in mind that the Thanksgiving day race at Ascot park may decide the A. A. A. national championship for the year, the owners of this 1-mile course have contracted for increased seating facilities. Bleachers are to be built that will seat 5,000. The track has not been used since last spring and the builders say it will be greatly improved as the result of the weathering. J. G. Griffin has been appointed contest manager for the fall season.

Jersey to Vote on Roads

Referendum on Egan Bill Providing for $7,000,000 Bond Issue to Improve Routes

Money to Be Repaid Out of Motor Vehicle Fund

TRENTON, N. J., Oct. 16—New Jersey voters will have a chance November 7 to say whether or not their state shall recover its lost position as the foremost commonwealth in percentage of improved roads. At the general election they will vote on a referendum question for the adoption or rejection of the provisions of the Egan bill creating a highway commission and providing for a $7,000,000 bond issue for the improvement of thirteen main highways.

New Jersey was the first state to adopt state aid for road building. That was in 1892. In 1904, 16½ per cent of the total road mileage of the state had been surfaced, and by January 1, last, this percentage had been increased to 39½ per cent, but Rhode Island, Massachusetts, Ohio, and Indiana had outdistanced New Jersey with a larger percentage of improved roads. The state might regain its premier position in a few years if the proposed bond issue is carried at the coming election.

There should be very little opposition to the bill, because it provides that all the bonds are to be repaid out of the funds collected from the motor vehicle registration fees, drivers' licenses and fines collected by the state. The motor vehicle owners favor the proposal because the money they pay will be used to construct the best types of roads, while other road users will get the benefit of the improved highways without any additional taxation.

The bill provides that these main routes shall be paved with granite, asphalt or wood blocks, brick, concrete, bituminous concrete, asphalt or other pavement having a hard surface and of a durable character. This is looked upon as a highly important feature, because it is costing the state about $1,000 a mile per year to maintain the present macadam roads.

President and Mrs. Wilson are motoring devotees

CLEVELAND WHEEL TAX DROPPED

Cleveland, O., Oct. 14—Cleveland wheel tax of $2 per wheel and an additional fee for motor trucks of $1 per ton for all trucks over 1-ton capacity, has been tabled. Its enactment into law is not a probability of the immediate future.

WANT $10,000,000 FOR ROADS

Mattoon, Ill., Oct. 14—Ten million dollars will be the appropriation asked of the next assembly of the Illinois legislature for good roads, according to a resolution passed at the annual meeting of the Egyptian Trail association, the Chicago to Cairo highway, held in this city recently.

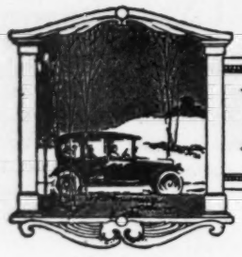
The resolution provides for a joining of interests of the Egyptian Trail association, the National Old Trails association, and the Lincoln highway in Illinois, petitioning the legislature to grant a special election for the purpose of issuing bonds in the amount above stated for building hard roads on the routes above mentioned in Illinois, to be built under the auspices of the state highway commission.

Each vice-president of the three organizations in Illinois is to circulate petitions to this effect, the same to be forwarded on completion to the president of each highway division.

LEE IS SPECIAL COUNSEL

Cleveland, O., Oct. 16—Richard H. Lee, former chairman of the legislative committee of the American Automobile Association and president of the Cleveland Automobile Club, is now a member of the paid staff of the National Viligance Committee as special counsel to give his attention to important investigation work of the committee. Mr. Lee represented the National Vigilance Committee in its case against the International Automobile League of Buffalo and A. C. Bidwell, its president.

Since obtaining a fraud order against Bidwell on August 3, supplemental orders have been issued to prevent Bidwell using the mails under the names of Robert J. Conley Co. and the Buffalo Automobile Tire Co. Mr. Lee now is engaged in the investigation of other motor frauds.



EDITORIAL PERSPECTIVES

Standardized Head Light Restrictions

THERE is a glaring need for standardization of headlight legislation. Admittedly the problem of preventing headlight glare and at the same time permitting good driving light for road work is one incompassed with difficulties, but there is a solution and it is up to the motor car fraternity to find the solution and see that the solution is made a part of traffic rules whether they be those of state or municipality.

WHETHER the solution be found in the proper direction of the beam, that is, by throwing the rays of light downward so that they will not rise above a given height at a given distance from the lamp, or whether it be by diffusion of the rays from the lamp or whether it be by some third method, the science has not advanced far enough to say, but there is some proper method. This method should be found and when found should be made a part of state and enlistment statutes.

PERHAPS the worst feature of the situation at present is the fact that practically no two cities have similar specifications for proper headlights which are unobjectionable from glare and where their restrictions do approach similarity there is very little similarity in the way traffic officers inforce them. Headlight glare can be quite as obnoxious and frequently much more dangerous on country roads than it is in the city. The blinding effect of dazzling headlamps is almost always an element of danger on narrow country roads. State laws, therefore, which will properly define glaring headlights and which are properly enforced are as much of a necessity, if not more of a necessity, than similar ordinances in the city.

ACTION of the central engineering body of the motor car industry, the Society of Automobile Engineers, in going more deeply into the subject of headlight specifications in order to solve the glare problem, may help toward this end. The society, through its standards committee, has endeavored to arrive at some standard specification for head lamps, such that sufficient illumination will be given for road-driving purposes without the troublesome and dangerous dazzling effect. The first of the year this committee, or rather the electrical equipment division of it, recommended: first, that lights be such as clearly to reveal all persons, vehicles, or substantial objects for a distance of at least 150 feet, wherever there is not sufficient light within the limits of the highway location to reveal such objects; second, that the headlight shall be so arranged that no portion of the reflected beam of light, when measured 75 feet or more ahead of the lamp, shall rise more than 42 inches above the level surface on which the vehicle stands; third, such headlights shall also give sufficient illumination to indicate any person, vehicle, or substantial object, 10 feet from the side of such vehicle at a point 10 feet ahead of the lamps; fourth, the term beam of light,s as used in the above provision, shall be construed as meaning the approximately parallel focalized rays gathered and projected by a reflector, lens, or other device.

IN general meeting the engineers cut down the recommendation so that in its abbreviated form it embodied the second clause only and in that form the recommendation does not meet the requirements completely. In the first place it gives only the maximum limit and does not in any way give the minimum degree of illumination, a feature which most cities consider essential and which really is necessary for the sake of safety. Further, it confines itself only to headlights whereas there are many side lamps which, while giving insufficient illumination for driving yet are nearly as pernicious from the standpoint of glare as are many head lamps.

THE attempt of the engineers' society shows a worthy desire but it is doubtful that it will go far towards a solution of the problem. It is dangerous in that it may have the effect of causing the somewhat prevalent idea that simply limiting the amount of light at its source is a solution. The chief pitfall into which most of the present headlight regulations have fallen is that in the endeavor to eliminate the glare they have simply eliminated illumination. This tends both toward decreasing the safety factor for which the lights are designed, that of illuminating the road so that objects in the way may be discerned in time to avoid an accident, and also to encourage disobedience of the regulation. This latter feature comes about through the fact that traffic officers in a number of cities have realized that it is impossible for drivers to obey the headlight law and have sufficient illumination to insure their own safety or that of others on ill-lighted streets, and in many instances the law has become almost a dead letter.

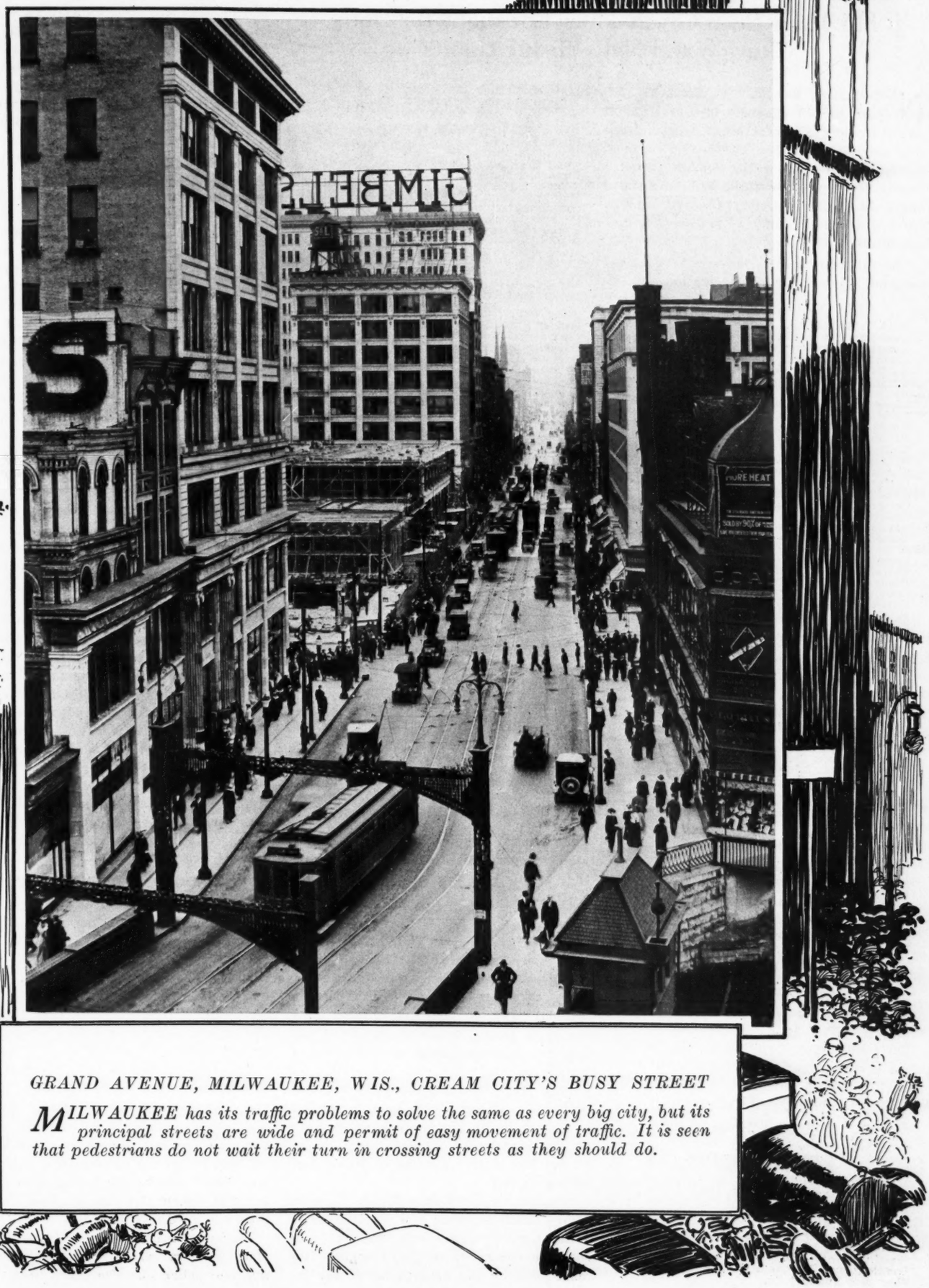
MUCH work is going forward toward the solution of this problem and it is to be expected that in time some really scientific method of defining a glaring headlight and of eliminating it will be found. The Society of Automobile Engineers is at work upon it and probably soon will be able to state a really workable recommendation, which will specify how the proper amount of light and the proper direction of light may be obtained, as well as what these necessary specifications are.

VARIOUS municipalities are working on the subject. Chicago has had a board of motor vehicle headlight inspection for 3 years which has issued certificates to such devices as were approved after inspection. St. Louis has an outdoor dark room into which the motorist must drive his car, upon request, and there has been no really co-ordinated action among the cities, and motorists who tour find that if they are to be free from risk of arrest in many cities on their itinerary, they must be prepared with sometimes two or three different illumination devices.

IN the absence of any federal legislation which would make headlight regulations uniform throughout the country, the next best plan would be uniform regulations adopted by each of the states. It is unfair to ask motorists to have one type of illumination for city and one for country use, or one type for one city and another for a different one. There are two states in which definite legislation has been passed on this These two states are New Jersey and Massachusetts.

MOTOR AGE hopes to assist in the universal adoption of standard headlight laws both by states and municipality and asks the co-operation and suggestions of its readers.

Busy Business Thoroughfare



GRAND AVENUE, MILWAUKEE, WIS., CREAM CITY'S BUSY STREET

MILWAUKEE has its traffic problems to solve the same as every big city, but its principal streets are wide and permit of easy movement of traffic. It is seen that pedestrians do not wait their turn in crossing streets as they should do.

Accessory Manufacturers Alloted Space

115 Have Been Given Their Locations for Both Chicago and New York Exhibits

NEW YORK, Oct. 16 — Allotment of space to 115 members of the Motor and Accessory Manufacturers Association was completed October 13, for the seventeenth annual show, to be held at Grand Central Palace, New York, and Coliseum and First Regiment armory, Chicago, January 6 to 13 and January 27 to February 3, respectively.

The following association members were assigned space at the shows mentioned:

NEW YORK AND CHICAGO

A. B. C. Starter Co.
American Bronze Co.
American Hardware Corp.
Corbin Screw Corp. Division.
Au-To Compressor Co., The.
Automobile Supply Mfg. Co.
Benford Mfg. Co.
Boyce Moto-Meter Co.
Brown-Lipe Chapin Co.
Brown-Lipe Gear Co.
Brunner Mfg. Co.
Buda Co., The.
Byrne-Kingston & Co.
Carr Co., F. S.
Celfor Tool Co.
Champion Ignition Co.
Corning Glass Works.
Cowles & Co., C.
Corcoran-Victor Co.
Cramp & Sons Ship & Engine Building Co., Wm.
Dann Products Co.
Detroit Weatherproof Body Co.
Dixon Crucible Co., Joseph.
Doehler Die Casting Co.
Dyneto Electric Co.
E. A. Laboratories Co.
Eclipse Machine Co.
Eclipse Storage Battery Co.
Evapco Mfg. Co.
Ferro Machine & Foundry Co.
Findeisen & Kropf Mfg. Co.
Gabriel Mfg. Co.
Gemco Mfg. Co.
General Electric Co.
Globe Machine & Stamping Co.
Gould Storage Battery Co.
Gray & Davis.
Halladay Co., L. P.
Hall-Thompson Co.
Hartford, Inc., Edward V.
Hassler, Robert H.
Hayes Mfg. Co.
Hayes Wheel Co.
Heinze Co., The John O.
Heinze Electric Co.
Kellogg Mfg. Co.
Kent Mfg. Works, Atwater.
Klaxon Co.
Kokomo Electric Co.
Leather Tire Goods Co.
Leece-Neville Co., The.
Lipman Air Appliance Co.
Lumen Bearing Co.
Mann Co., F. W.
Master Carbureter Corp.
Mosler & Co., A. R.
New York Coil Co.
North East Electric Co.
Otis Elevator Co.
Pantasote Co., The.
Parry Mfg. Co.
Perfection Spring Co., The.
Piel Co., The G.
Prest-O-Lite Co., The.
Royal Equipment Co., The.
Sager Co., J. H.
Schrader's Son, Inc., A.
Shakespeare Co.
Shaler Co., C. A.
Sparks-Withington Co., The.
Splitdorf Electrical Co.
Springfield Body Co., The.
Standard Thermometer Co.
Standard Welding Co., The.
Stewart-Warner Speedometer Corp.
Stromberg Motor Devices Co.
U. S. Light & Heat Corp.
Universal Shock Eliminator, Inc.
Vacuum Oil Co.
Van Sicklen Co., The.
Veeder Mfg. Co., The.
Voorhees Rubber Mfg. Co.
Wagner-Hoyt Electric Co.
Waltham Watch Co.
Westinghouse Electric & Mfg. Co.
West Side Foundry Co.
Wheeler-Schebler Carbureter Co., Inc.
Willard Storage Battery Co., The.

NEW YORK ONLY

Blackledge Mfg. Co., J. W.
Bosch Magneto Co.
Breeze Carbureter Co.
Budd Mfg. Co., Edward G.
English & Mersick Co., The.
General Bakelite Co.
Hale & Kilburn Co.
Hartford Machine Screw Co.
Herz & Co.
Janney-Steinmetz & Co.
Light Mfg. & Foundry Co.
Morse Chain Co.
Rubber Insulated Metals Corp.
Syracuse Malleable Iron Works.
Ward Leonard Electric Co.
Zenith Carbureter Co.

CHICAGO ONLY

Badger Brass Mfg. Co., The.
Continental Motors Co.
Edison Storage Battery Co.
Garford Mfg. Co., The.
Imperial Brass Mfg. Co., The.
Oakes Co., The.
Remy Electric Co.
Simms Magneto Co., The.
Vesta Accumulator Co.
Warner Gear Co.
Waukesha Motor Co.
Wilson & Co.

FORD-TRIBUNE HEARING SOON

Chicago, Oct. 16—Henry Ford's $1,000,000 libel suit against the Chicago Tribune is moving ahead. The Tribune has filed its demurrer in the United States District Court. In order not to take advantage of technical objections and errors and thereby delay the final disposition of the litigation a general demurrer has been filed. This pleading is intended, the lawyers explain, to clarify the atmosphere and get down to brass tacks.

A special demurrer could have been filed, picking flaws with Mr. Ford's bill and thereby causing delay. This has been avoided, the attorneys explain, by seeking to join the issue on the merits of the controversy and pave the way for a speedy trial.

The general demurrer simply sets up the article complained of by Mr. Ford and contends all of it or any part of it does not constitute a libel.

U. S. NOT BACKING YOSEMITE ROAD

Chicago, Oct. 16—In the September 28 issue of Motor Age there appeared a story telling of a proposed cutoff in Yosemite National park through the building of a new road and a tramway to lower and raise cars between the floor of the valley and the mountain top. We are advised by Stephen T. Mather, assistant to the secretary of interior, that such a project would not under any circumstances have the consideration of the department of interior. Mr. Mather's letter to Motor Age follows in full:

"Darien, Conn.—Editor Motor Age—In a story which appeared in a recent issue of Motor Age, reference was made to proposed developments in the Yosemite National park by the department of the interior. It was stated that a tramway was to be constructed down the canyon walls to the floor of the Yosemite valley, intimating that such plans had been decided upon as the result of my visit to the park this summer.

"While many interesting developments are being made in this national playground for the benefits of visitors, the construction of an incline has not even been contemplated by the department. The Tioga road, which runs across the park from east to west, has opened up a new route for the motorist through the upper park country. A cut-off from this road will lead out to the edge of the great canyon, where a splendid view of the valley will be obtained, but the motorist who wants to make a quick trip to the valley from this point will not find a 'funicular' waiting to transport his car. He will find a good trail suitable for saddle animals and hikers, on which he can make a leisurely trip to the floor of the valley. His other alternative is to drive his car a matter of 50 miles with superb scenery on every side, and then down through magnificent groves of sugar and yellow pine by the Big Oak Flat road to the valley, surely much to be preferred to any plan which contemplates dropping his car down by a cable in a half dozen minutes.

"The new hotels and camps which are now being built in the Yosemite park under government supervision are going to make the park, next summer, accessible in a way it never has been before, and the federal government is expending $250,000 in improving roads and trails and the construction of a new electric powerplant to supply the hotels with light and heat.

"With all these developments under way, and while realizing that the creature comforts of the visitor must be catered to, it is the steadfast purpose of the National Park service to preserve the natural beauties of this wonderland as free from blemish as possible."—Stephen T. Matther, Assistant to the Secretary of the Interior.

BORDER COURSE FOUND TO BE FAST

Phoenix, Ariz., Oct. 14—Tooling a stock touring car over the 275-mile course of the Douglas-Phoenix road race, to be held November 13, Dick Hollingsworth, A. A. A. promoter and starter, Lyle Abbott, referee at the finish and R. E. Lewis, a Phoenix motor car dealer, indicates that the next Borderland effort will eclipse all previous ones for speed.

The trip was made in order that Hollingsworth might name checkers, secure the official permission of cities, counties, and towns to raise the speed limit, and to put some pep in the business of raising divisional purses for the winners. The road was found two to one better than it was in 1914, when the last El Paso-Phoenix race was held over it.

Mayor W. A. Adamson, Douglas, will start the first car at 6:30 Monday morning, November 13. The other twenty-nine

cars will get away at 3 minute intervals. Soldiers of the regular army, mounted on motor trucks, motorcycles and in roadsters, will be lined up along the 27-mile straightaway between Douglas and Bisbee, to patrol the course and to render first aid in case of accident. At the finish line, members of the First Arizona infantry, the entire regiment of which will be stationed here, will guard the approaches to the state fair grounds, to inforce certain simple safety-first rules.

Bisbee, Tombstone, Tucson and Florence, the chief towns along the route, will also observe safety-first rules promulgated by the officials.

TWO RECEIVERS FOR SPEEDWAY

Minneapolis, Minn., Oct. 16—The Twin City Speedway Association now has two receivers. The Hennepin county court has appointed Elijah Barton at the request of the Minneapolis Trust Co., to represent the mortage or bond interests. The previous appointment was in Ramsey county of P. W. Herzog in the interest of creditors. The new receiver has power to protect the property with watchmen and insurance. B. H. Schriber, representing the creditors' receiver, said he is confident they will be paid 100 cents on the dollar.

BRITISH MOTOR TRUST

New York, Oct. 14—According to reports from England, several big munitions concerns there, formerly engaged in motor vehicle manufacture, are contemplating pooling their capital to an amount aggregating £30,000,000—$145,000,000—combining to produce low-priced vehicles in quantity.

CLEVELAND TO RESTRICT TRAILER

Cleveland, Oct. 14.—The use of more than two trailers per motor truck will be prohibited in Cleveland, if a proposed new traffic law as discussed in the common council on October 9 is enacted into law. In addition, the use of one or two trailers in connection with a motor truck will require that an extra man accompany the driver when such trailers are being used, provided the trailers are loaded with more than 500 pounds.

The proposed measure further provides that when a hill of more than 5 per cent is being ascended, the extra man must be on the rear trailer. The latter must also be equipped with suitable brakes or safety chains.

The most objectionable feature of the proposed ordinance is perhaps that which would seek to forbid the use of the streets to any trailer with steel tires in which the total weight of the trailer and its load was in excess of 750 pounds. If this recommendation is made into law it will cause practically every semi-trailer in the city to be laid up.

New Jersey Truck Measure Is Protested

If It Becomes a Law Commercial Vehicles Will Probably Show a Decline

NEW YORK, Oct. 13—It will be commercially impossible to operate any kind of a motor truck in New Jersey if the recommendations of the special committees appointed by William L. Dill, commissioner of motor vehicles of that state, are enacted into law. These recommendations were aired for the first time at a public hearing held in the court house in Newark, N. J., October 2, and showed that the committee which formed them has such an utter lack of understanding of the operation of motor trucks as to make it ridiculous. Among the most glaring of the impossibilities which the ignorance of the committee seeks to place upon the motor truck operator are that each truck driver must carry way bills for each load, said way bills to show the gross weight and net weight carried, and that all commercial vehicles shall carry a spare wheel, so as to avoid the possibility of any part of the steel rims coming into contact with the surface of the road, should the rubber tires become broken or otherwise damaged.

In regard to the recommendation that each truck carry a spare wheel to be applied to the truck on the road in case any of the rubber tires became broken or otherwise damaged, it would be highly amusing, indeed, to have the committee state how the driver of a 5-ton truck and his helper could replace one of the vehicle's rear wheels, weighing about 1,200 pounds apiece, on the road without the aid of some sort of derrick or crane.

Nor were the two recommendations mentioned the only ones which the committee, which is formed of engineers of several of the counties of the state, would seek to impose.

It also would seek to limit the width of any truck over 4,000 pounds weight to 96 inches, outside measurements. It would provide an exception in extreme cases to privilege an operator to use a truck over 96 inches wide if the weight of the load is not a factor. It is not apparent on the surface what effect the width of the vehicle has on the load of a truck. Nor is it clear why a truck weighing less than 4,000 pounds may have a greater width than the maximum provided for a 2-tonner.

INSPECT ILLINOIS BRICK ROADS

Paris, Ill., Oct. 13—Four hundred tourists, in cavalcade formation, tested the quality of Edgar county, Ill., highways Friday, October 6. Their curiosity had been roused by tales of the monolithic brick pavement developed in and around Paris, Ill., during the season of 1915 and 1916. Many of them were engineers and highway officials. The substantial citizens of Paris, who piloted the visitors in their cars, bore eager testimony to the pleasure and profit which this system of roads has brought them.

This pavement was minutely inspected. Its merits were tested by a drive in which the citizens of Paris acted as hosts, but the most absorbing interest centered around the demonstration of actual paving methods in laying a 12-foot, curbless, monolithic pavement on a rural road some 2 miles north of the business section of Paris. This demonstration was a climax to a 2-day session of the National Paving Brick Manufacturers' Association. The major part of this session took place at Terre Haute, Ind.

JAILED FOR SLOW DRIVING

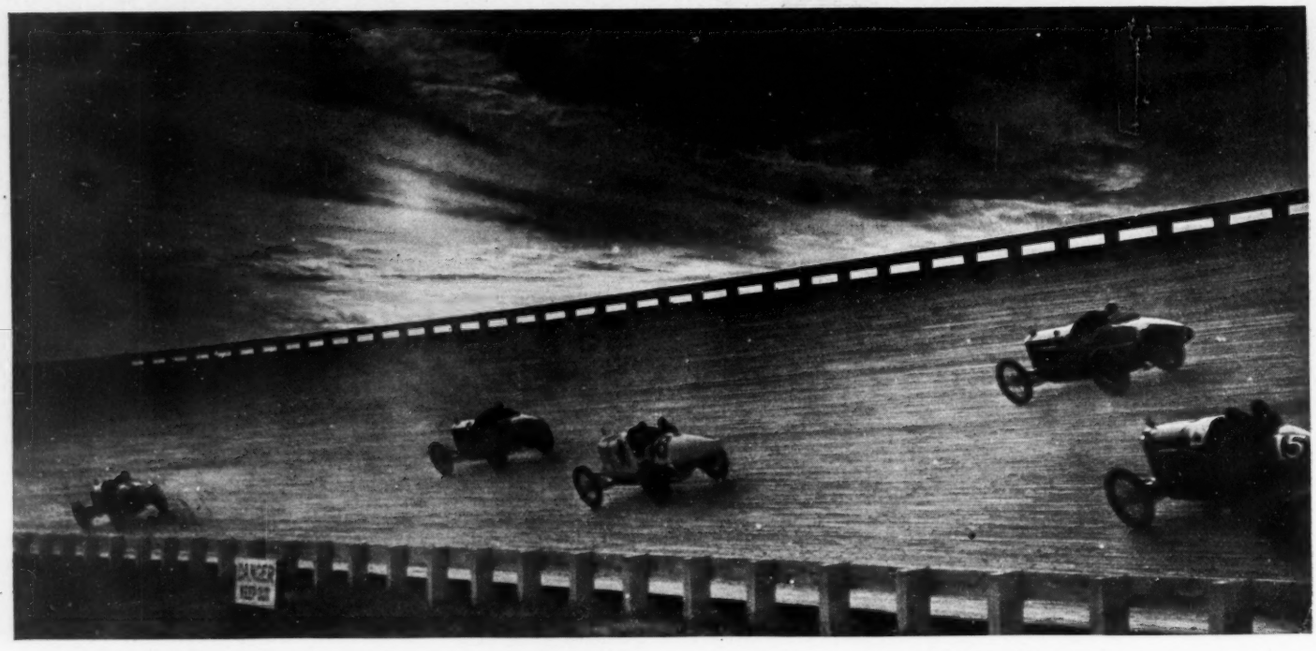
Worcester, Mass., Oct. 14—While thousands of motorists have been arrested and fined for fast driving in Massachusetts the first case where a motorist was brought into court for slow driving occurred here yesterday. Edward C. Smith of Leominster was before Judge Utley on a charge of driving so slowly that he obstructed traffic. Traffic Officer Lyman J. Gorton testified that Smith came along to Harrington corners the busiest place in Worcester, and he drove his car so slowly that he held up traffic. He had been drinking, which accounted for his actions, it seems, and he wanted to be very careful rather than reckless. He was sentenced to 2 months in the house of correction.

$15,000,000 FOR CALIFORNIA ROADS

Los Angeles, Cal., Oct. 16—A campaign for $15,000,000 of bonds for highways, to be voted on in California at the general election November 7 is being instituted by a good roads committee of 100.

In 1912 the state voted $18,000,000 for trunk roads north and south, with which 1,122 miles of paved highway has been constructed. An additional $12,000,000 is required to complete the system to include the 2,900 miles originally planned. The $3,000,000 additional, if the bonds are voted, will be utilized in the construction of new trunk lines, one of which will open up miles of hitherto inaccessible mountain scenery in the Mt. Whitney district adjacent to Los Angeles, now famed for its hunting and fishing.

Interest on the proposed issue will be paid by the counties in proportion to the work done therein. It is believed that this provision will aid materially in carrying the bonds. Los Angeles county will pay more than any in the state, but its highway system will be benefited in proportion.

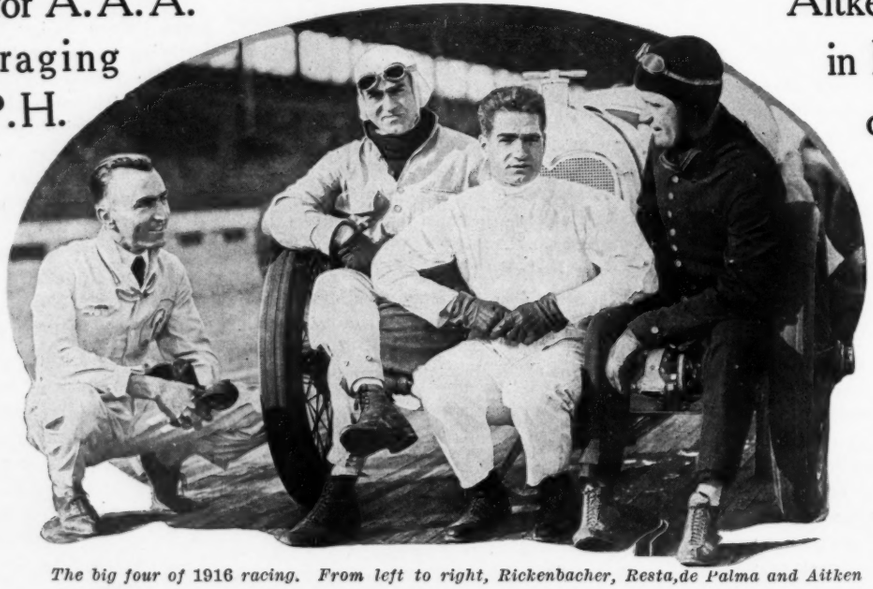


The motors' song at sunset on the Chicago speedway—Resta and Aitken, ahead, pass Vail on the turn

Resta Wins Again at Chicago

Takes Lead for A.A.A. Title Averaging 103.99 M.P.H.

Aitken Is Second in Hot Contest of 250 Miles



The big four of 1916 racing. From left to right, Rickenbacher, Resta, de Palma and Aitken

DRIVER	CAR	TIME	AVERAGE M. P. H.	PRIZE
Resta	Peugeot	2:24:16.68	103.99	$6,000
Aitken	Peugeot	2:24:32.61	103.65	3,000
Rickenbacher	Maxwell	2:25:52.76	102.08	1,500
Lewis	Premier	2:32:28.93	98.37	1,000
Henderson	Maxwell	2:32:31.39	98.34	900
Galvin	Premier	2:33:20.50	97.81	800
Devore	Duesenberg	2:45:35.43	90.58	600
Burt	Ogren	2:52:05.35	86.66	500
Gable	Erbes	3:04:52.23	81.13	400
Vail	Hudson	3:05:37.37	80.81	300

By Darwin S. Hatch

CHICAGO Speedway, Oct. 14—Dario Resta, at the wheel of the same blue Peugeot with which he has won every big event staged at the Chicago speedway this year, captured the 250-mile Grand American yesterday at a speed of 103.99 miles per hour, less than 1 mile an hour slower than the record established by Aitken at Sheepshead Bay 3 weeks ago. His time was 2 hours, 24 minutes, 16.68 seconds, 1 minute 12 seconds slower than Aitken's time in the Astor cup event. It was the closest race of the season.

Resta, incidentally, placed himself by this win in the lead for the A. A. A. championship title, and the Bosch and Goodrich trophies to which Aitken has been heir apparent since the Astor cup event.

Aitken, also is a Peugeot, was second today, just 16.7 seconds behind the winner. Rickenbacher took third, less than 1 minute, 20 seconds behind Aitken. Rickenbacher drove the same Maxwell that he has been campaigning all the year and his usual hard luck forsook him.

The race was between the four favorites, Aitken, Resta, de Palma and Rickenbacher, and de Palma led for 120 miles in one of the most closely fought contests ever seen on an American speedway, until he lost first to Aitken on account of a tire change. De Palma's ill luck was still with him

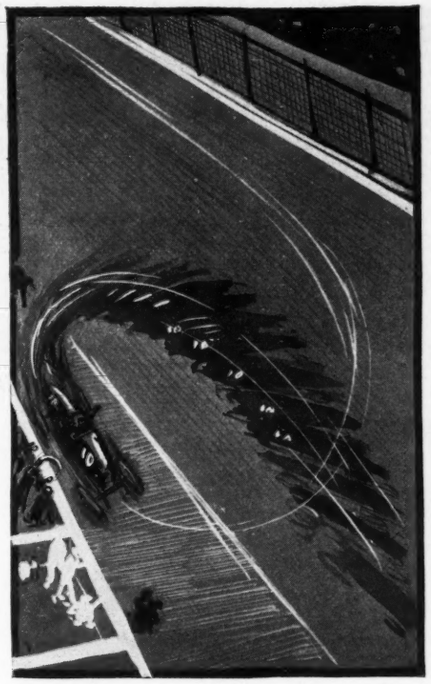
Resta Leads for A. A. A. Title

BY WINNING today's race, Resta captures the $6,000 prize offered for first place and also takes the lead for the title of A. A. A. champion and the Bosch and Goodrich trophies.

Until today, Aitken, winner of the Derby at New York, headed the list. Resta was second, Rickenbacher, third, and de Palma, fourth. Today's victory nets 800 points for the winner, 420 for second, and 220 for third. This puts the standing of the four leaders as follows:

Resta	3,200
Aitken	2,924
Rickenbacher	2,210
De Palma	1,790

There is still the Harkness trophy race and Santa Monica on the A. A. A. championship schedule, so the title is not safe yet. This title carries with it $15,000 in prize money, together with the $13,500 purse offered by Goodrich and the Bosch companies, which is to be divided among the three leaders.



Aitken's circle in front of the grandstand was a spectacular stunt

A. A. A. Championship Standing

Resta	3,200	Le Cain	120
Aitken	2,940	Oldfield	80
Rickenbacher	2,210	Toft	75
De Palma	1,790	Pullen	75
D'Alene	1,120	Haibe	60
Milton	690	Cooper	55
Mulford	620	Stringer	5
Henderson	587	Adams	55
Christaens	540	Gable	45
Lewis	500	Wilcox	40
Vail	450	Chandler	40
Galvin	385	Watson	35
DeVigne	350	Sorenson	35
Hughes	275	Johnson	30
Buzane	210	Devore	30
O'Donnell	185	McCarthy	25
Delvin	140	Burt	25
Klein	125	Muller	20

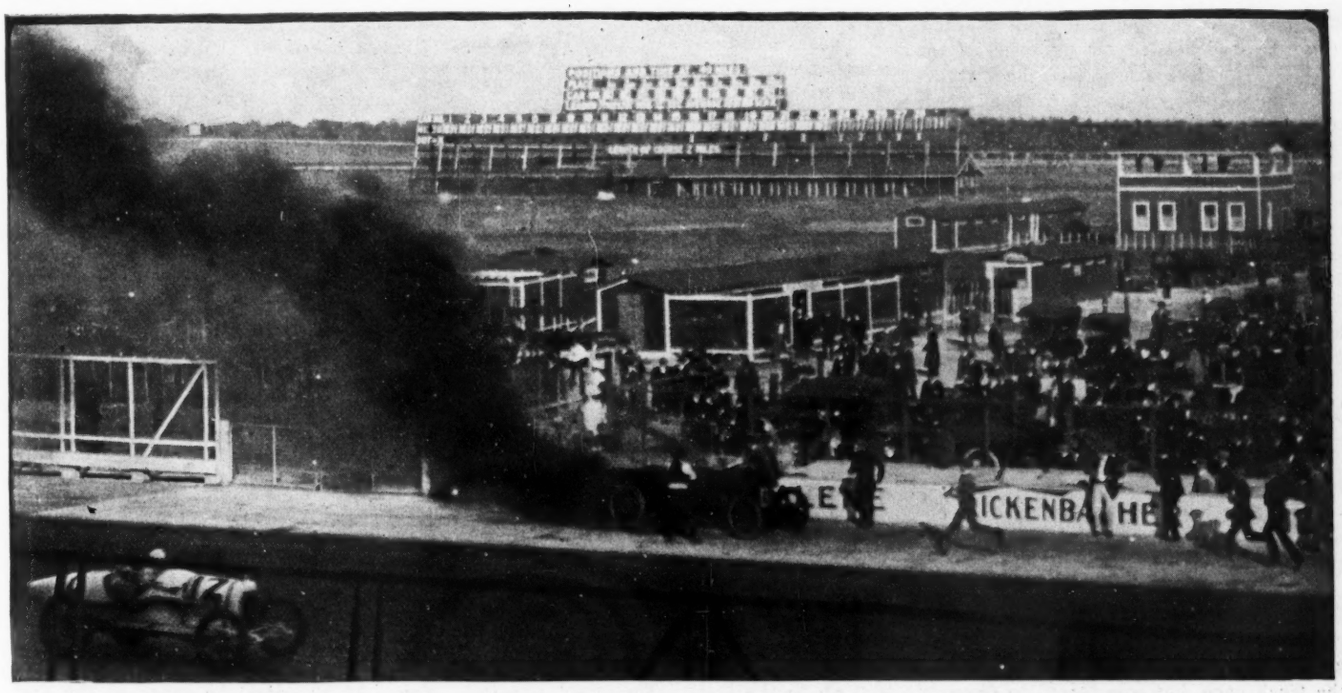
Although the time for the 250 miles did not equal that made at New York in the Astor cup race, local records are broken. Resta battering his own record of 97.70.

250-MILE RECORDS

World's Record, Aitken, Peugeot, Sheepshead Bay, 104.83 miles per hour.
Chicago Track, Resta, Peugeot, 103.9 miles per hour.
European, Chassagne, Sunbeam, Brooklands track, 97.77 miles per hour.

and he dropped back to third through two stops caused by a broken valve which was the ultimate cause of his withdrawal.

Lewis, in a Premier, and Henderson, in the second Maxwell, captured the next three places in the order named and came in together, some 6 minutes behind the first three, a difference of less than 3 seconds between them. Galvin, in the other



The flames from D'Alene's Crawford rose 10 feet into the air as the gasoline was ignited by the exhaust, but the J.-M. fire extinguisher crew put it out before great damage was done

Times of All Starters Each 20 Miles or 10 Laps of the 250-Mile Chicago Race, October 14, 1916

Pos.	Car.	Driver.	No.	20 M.	40 M.	60 M.	80 M.	100 M.	120 M.	140 M.	160 M.	180 M.	200 M.	220 M.	240 M.	250 M.	Av. m.p.h.
1	Peugeot	Resta	4	11:36	23:06	34:28	45:56	57:19	1:08:42	1:21:12	1:32:42	1:43:59	1:53:08	2:07:01	2:18:30	2:24:16.68	103.99
2	Peugeot	Aitken	10	11:37	23:08	34:29	45:56	57:20	1:08:43	1:20:10	1:31:38	1:43:06	1:54:53	2:07:03	2:18:38	2:24:32.61	103.65
3	Maxwell	Rickenbacher	12	11:39	23:09	35:45	47:26	59:55	1:10:20	1:20:48	1:32:29	1:45:25	1:56:57	2:08:29	2:20:05	2:25:52.76	102.08
4	Premier	Lewis	6	12:19	23:16	36:30	47:52	1:00:01	1:13:22	1:24:07	1:36:14	1:49:24	2:01:28	2:13:16	2:26:36	2:32:28.93	98.37
5	Maxwell	Henderson	3	12:02	24:13	36:22	47:35	1:00:57	1:13:05	1:25:12	1:37:27	1:49:23	2:01:19	2:13:14	2:26:41	2:32:31.39	98.34
6	Premier	Galvin	11	12:20	23:24	36:45	47:55	1:00:03	1:13:24	1:25:22	1:37:28	1:49:35	2:01:38	2:13:41	2:27:07	2:33:20.50	97.81
7	Dusenberg	Devore	21	12:00	23:09	36:18	50:51	1:02:36	1:17:36	1:32:36	1:47:14	1:59:09	2:11:49	2:23:45	2:35:53	2:45:35.43	90.58
8	Ogren	Burt	2	11:58	23:14	37:16	51:00	1:03:39	1:17:25	1:36:08	1:48:41	2:03:40	2:17:35	2:30:08	2:37:44	2:52:05.35	86.66
9	Erbes	Gable	15	11:51	24:06	36:19	51:53	1:06:37	1:21:36	1:38:14	1:52:22	2:08:09	2:22:54	2:38:38	2:56:23	3:04:52.23	81.13
10	Hudson	Vail	18	12:26	23:08	36:19	48:29	1:23:13	1:37:31	1:50:36	2:06:12	2:20:23	2:32:28	2:46:46	2:58:55	3:05:37.37	80.81
	W. Duluth Spec.	Rawlings	5	12:09	24:07	36:12	47:38	1:09:29	1:26:42	1:41:05	1:55:22	2:10:55	2:55:16	2:39:46	3:02:45	Flagged	
	Dusenberg	Buzane	14	12:31	29:04	42:05	54:35			Running at finish—Flagged							
	Peugeot	Wilcox	1	11:59	23:52	35:38	47:18	58:56	1:10:35	1:22:18	1:34:04	1:45:49	1:57:42	2:09:45	2:21:26	Out brkn. c. rod	
	Peugeot	DePalma	9	11:34	23:03	34:23	44:37	55:50	1:07:08	1:19:37	1:33:00	1:43:28	Out at 194th mile—Broken valve				
	Ostewig	Ostewig	23	11:53	30:55	52:12	1:21:28	1:37:34	1:50:36	2:10:16	2:23:58	Out 172nd mile—Slipping clutch					
	Crawford	Kline	8	12:03	23:09	36:38	47:45	1:00:05		Out 112th mile—Broken crankshaft							
	Crawford	D'Alene	13	11:38	23:31	36:17	56:24			Out 90th mile—Broken shaft							
	Dusenberg	Milton	17	11:45	23:05					Out 42nd mile—Clutch facing torn out							
	Hoskins	Hughes	19	11:37						Out 40th mile—Broken connecting rod							

Premier, was less than a minute behind his teammate. Devore, in the Duesenberg, finished seventh; Burt, in the Ogren, eighth; Gable, in the Erbe special, ninth, and Vail, in the Hudson, tenth. Rawlings, in the Duluth special, was running at the finish, making almost the entire distance on three cylinders. Buzane also was running when the race was called.

All track records were smashed up to the end of the first 40 miles by de Palma, who averaged for the twenty laps, 105 miles an hour.

Only One Accident

One accident marked the day's event and one which may cause the death of Ralph Hedlich, mechanic for William D'Alene, driving the Crawford. D'Alene came into the pits at the end of his fifteenth mile for gasoline and the excited pit man spilled gallons of gasoline onto the track under the car and finally some of it, when the funnel was knocked off, was ignited by the exhaust. The car and the gasoline below it burst into flames which rose to 10 feet in the air. Hedlich's clothing was splattered with burning gasoline and, temporarily crazed by the pain, he ran up the track toward the judge's stand. Here he was headed off by some of the officials who forced him into the dirt under the judges' stand and wrapped coats about him until the burning clothing could be torn off. He was rushed to the hospital where hope for his recovery is held out, although he is very seriously burned.

Billy Chandler, captain of the Crawford team, also was burned about the hands and throat and the back of the head. It was necessary to force him into the ambulance as, in spite of his injuries, he insisted on endeavoring to help Hedlich.

The fire about the Crawford car was put out in short order by the rapid and efficient work of the J.-M. fire extinguisher crew, which, in spite of the fact that it had to run the entire length of the pits to reach the burning car, managed to subdue the flames before great damage had been done to it.

While the car was still hot and smoking from its inundation in flame, D'Alene again took the wheel with a substitute mechanic and resumed the race. He circled the track once, but was forced to come in with the brake bands still burning to change one of the rear wheels whose tire had been damaged by fire. Also, to make another attempt to fill the gasoline tank. D'Alene was able to make only four laps more before the scorched car was pushed down the track with a broken driveshaft. When he took the wheel after the fire the show of nerve brought forth a great cheer from the grand stand.

Ten thousand American citizens suffered the American flag to be torn down and tramped on without protest. The flag was on fire

The actual start after the preliminary lap was a very pretty one, the line being well kept for the getaway. Aitken led at the end of the second lap, but de Palma took the lead at the third lap, having passed Hughes, Resta, Henderson, Wilcox and Aitken in a 2-mile spurt that brought the grandstand spectators to their feet. The order at this time was: de Palma, Resta, Aitken and Hughes, with a gap beginning to open up between these four leaders and the rest of the field, all of whom were leaving Gable and Buzane some distance in the rear. At the end of the first 10 miles Gable, who was hitting bad, was lapped in front of the grandstand. Wilcox and Henderson had crawled up until they were respectively second and third to de Palma, with Aitken, Hughes, Resta and Rickenbacher following in order.

D'Alene again began to show among the leaders and at the end of 14 miles was well up to the front. The speed was too fast for him and he did not maintain his position long. Before 20 miles were gone the speed began to tell on some of the cars and they began to come into the pits. Burt's Ogren being docked temporarily, first, and followed shortly by Buzane and Vail.

The space was a terrific one, de Palma's time for first 20 miles being 11 minutes, 34 seconds, a speed of nearly 104 miles per hour, with Resta, Hughes, Aitken and Rickenbacher all close at his heels. Resta's time was only 2 seconds slower than de Palma's, while Aitken was running half a length behind. D'Alene, Hughes and Burt, were all very close up.

De Palma Still Leads

During the next 10 miles Aitken and Rickenbacher passed Hughes and the order then was de Palma, Resta, Aitken and Rickenbacher. De Palma was being sorely pushed, the three Peugeots running so close together that there was not a car length between de Palma and Aitken. Rickenbacher was 100 yards behind. All were traveling at better than 103 miles per hour. Hughes went out with a broken valve spring in the thirty-second mile and it was this that had caused him to lose his position during the few miles previous. Hughes asked of the car more than it would stand, and while he made a wonderful showing for the first 25 miles, the mechanism would not stand the speed he called from it.

For the next 70 miles the four-cornered race between the leaders continued, with the speed slowly increasing, and lapping car after car as the three blue Peugeots and the white Maxwell fought for the lead. But de Palma was never headed in the first century. At 40 miles the time was 23:03.65 seconds, a speed of 104 miles per hour. At 50 miles it was 29:40 seconds, 102 miles per hour.

Between 60 and 80 miles the speed climbed rapidly to 107.5 miles per hour, and the positions were unchanged — the three leaders being less than a car length apart. Rickenbacher was the first of the quartette to show the effect of the terrific pace, having to come into the pits at about 76 miles for a right rear tire. His pitwork was fast and his time lost slight, not enough to cause him to lose his fourth position. At 80 miles the order of the first ten was as follows: De Palma, Resta,

Aitken, Rickenbacher, Wilcox, Devore, Milton, Henderson, Klein, Lewis. De Palma's time for this distance was 44:37, a speed of little better than 107 miles per hour. At 90 miles the order was practically the same throughout, and the speed decreased slightly to 107 miles per hour. De Palma was still leading at the 100-mile point and his time was 55:50, a speed of 107.2 miles. De Palma came in shortly after this, making his first stop and changing a right rear tire. This caused him to drop back into third place as Resta and Aitken both passed him while he was slowing down for the pit.

Rickenbacher was improving his opportunity to make up time lost by his stop and still further increased his spead, when he saw de Palma at the pit and was making laps at 108 miles per hour.

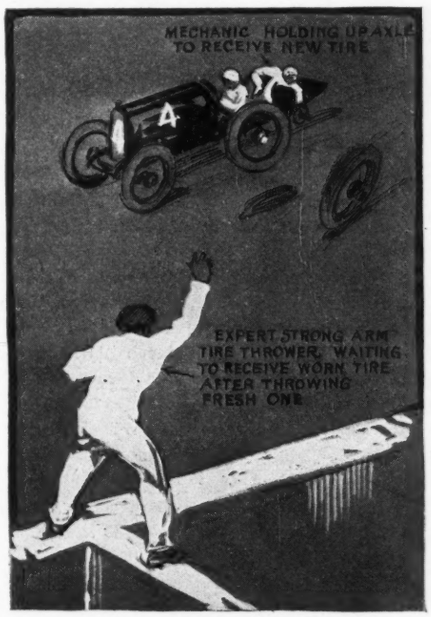
With de Palma temporarily out of the lead, Resta set the pace with Aitken close to his heels, so that at the 120-mile mark Resta was leading, Aitken second and de Palma third, with Rickenbacher fourth. The time at this point was 1:08:42, a speed of 104 miles per hour.

Resta Stops at Pits

The terrific pace brought Resta in to the pits on the next lap for supplies, taking on gas and changing a right rear tire. The pit work was very fast, Resta being held only 28 seconds.

Aitken had not stopped as yet and the two halts by the leaders put him at the front. This he held for the next 70 miles. Resta's stop let de Palma overtake him so that the Italian was pushing Aitken for first with Resta and Rickenbacher following. From the 140-mile point until after approximately 190 miles had been covered he challenged the leader and then came in missing badly, and after a lap or two withdrew with a broken valve.

Almost at the same time Aitken very nearly ended his chances for finishing the race when in coming in with a bad tire for his first stop at the pits, skidded badly turning completely around, but by masterly handling kept the car on its four wheels and pulled up at the pits, facing it exactly the wrong direction. He was away in 30 seconds, but meanwhile Resta had passed him and taken the lead. The old National driver gave the car all it would take when he took up the chase of the Italian and turned several laps in 1:05, a speed of better than 109 miles per hour. At 200 miles, Resta was leading, Aitken, second; Rickenbacher, third, and Wilcox, fourth. Resta made the distance in 1:53:08, with Aitken only 2 seconds behind. Rickenbacher was a minute 1:28 behind the leader and Wilcox was over 2 minutes behind, having been lapped by Resta and Aitken. Their speed at this point was over 106 miles per hour.


MECHANIC HOLDING UP AXLE TO RECEIVE NEW TIRE
EXPERT STRONG ARM TIRE THROWER, WAITING TO RECEIVE WORN TIRE AFTER THROWING FRESH ONE

Artist's suggestion to Resta for lowering the tire change record still more

Resta and Aitken ran neck and neck for the 50 miles remaining, but Resta was always a nose ahead of the Indianapolis driver, except for one short space, when Aitken succeeded in crowding ahead temporarily. Resta undeniably could have made more speed at this time had it been necessary.

So close were the two leaders that Starter Wagner's dramatic wave of the checkered flag at the finish sufficed for both the Italian and the Hoosier driver.

Today was a day for fires at the Maywood track. The Crawford, with its unlucky 13, was the only one which was serious, but the other two had possibilities of danger. Devore's Duesenberg caught on fire early in the race at the pit when the driver had flooded things in general in working with his carbureter.

Another Small Fire

The other fire was an incipient conflagration which started from a carelessly thrown match or cigar in the bunting which decorated the front of the grandstand. Attendants had the burning bunting ripped off before any damage was done and there was little excitement in the grandstand. Probably only a few of the spectators, and those immediately behind the place where it occurred, knew anything had happened.

Aside from this there were no untoward accidents and no possibilities of any other than the usual risk when a score of cars are traveling at high speed. The race as a whole was very well handled, the track perfectly guarded. On the other hand, the score boards and announcing were many laps behind the progress of the race. The score boards were the worst in this respect, being neither up-to-date nor always cor-

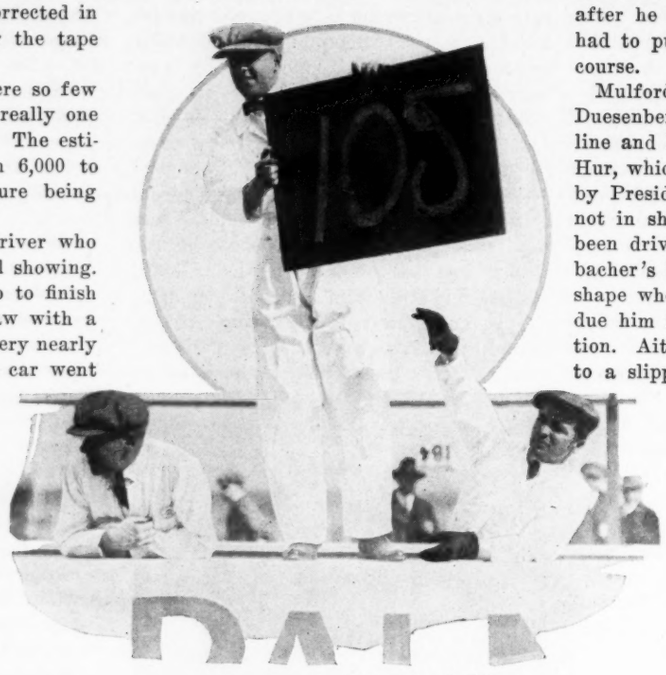
Ralph Hedlich, the mechanic, just as he fell over the barrier in front of the judges' stand. The pain from the fire in his gasoline-soaked clothes temporarily crazed him, and he ran up the track from the pits

rect. First announcements gave Henderson fourth place, but this was corrected in the official announcements after the tape had been rechecked.

It is regrettable that there were so few spectators to witness what was really one of the best races of the season. The estimates of attendance vary from 6,000 to 10,000, probably the latter figure being more nearly correct.

De Palma was not the only driver who had hard luck after a wonderful showing. Wilcox, with only one lap to go to finish in fourth place, had to withdraw with a broken connecting rod. Galvin very nearly had a similar experience as his car went out while he was making an additional lap after he had been flagged in fourth, and had to push his car part way around the course.

Mulford, who was slated to drive a Duesenberg did not appear at the starting line and Devore took his place. The Ben Hur, which was a local entry and fathered by President Reid of the speedway, was not in shape to start. This was to have been driven by Louis Chevrolet. Rickenbacher's Maxwell was not in the best of shape when he started and much credit is due him for jockeying it into third position. Aitken blamed his losing of the race to a slippery clutch.



Signal work at de Palma's pits

The Race from Pits

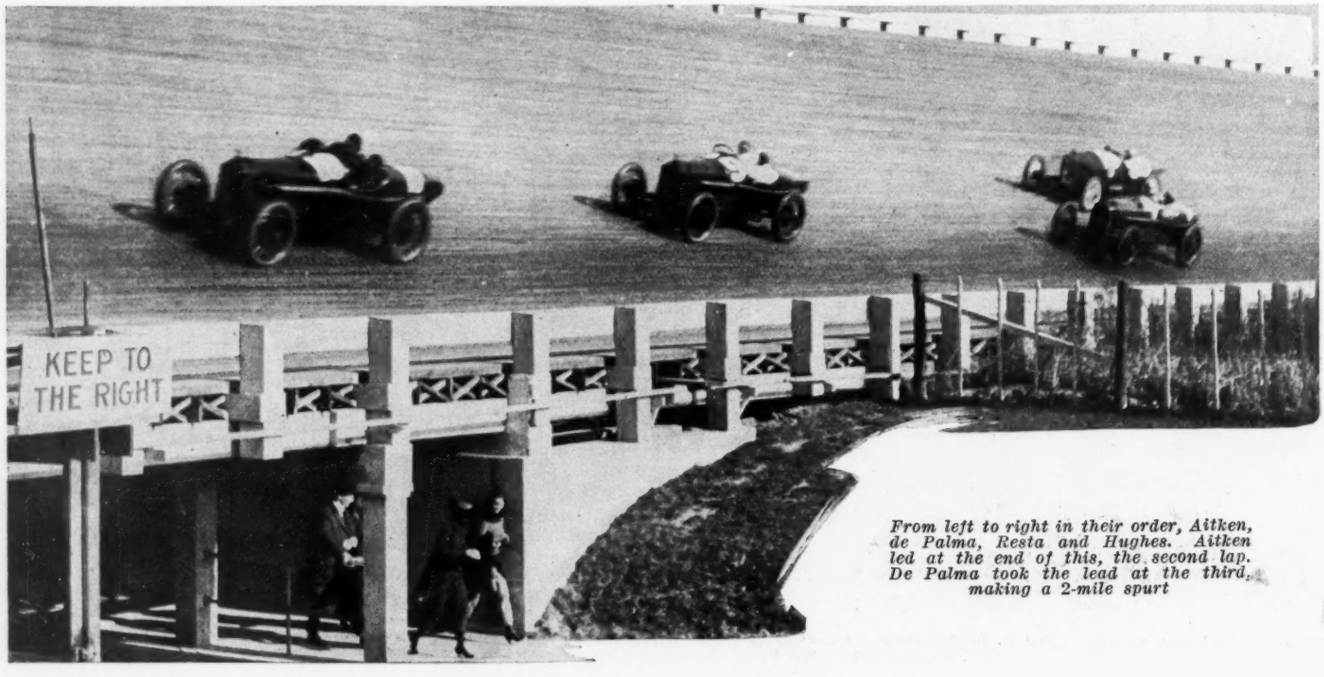
By Wallace B. Blood

CHICAGO Speedway, Oct. 14—Two dazzling pyrotechnic displays and a hair-raising skid which cost a first place, made the pits an exciting place in today's, the greatest, Chicago speedway race. The J.-M. fire extinguishing crew, in the first instance, and John Aitken, with his masterly driving, in the second, probably prevented fatalities, although it is still a question whether Hetlich, mechanic of Wilbur D'Alene, who was badly burned, will survive.

The race developed an old ailment in aggravated form. Slipping clutches have seldom held such an important part in speedway events. Ostewig, in the car bearing his name, was in the pits four times, consuming in the neighborhood of 20 minutes, dosing his clutch with dirt, sand, and finally inserting hack-saw blades to lock it in place. Milton went out entirely with a shredded clutch facing and it was the claim that Johnny Aitken's speed was reduced throughout the contest by a clutch that persisted in increasing the ratio between the engine and the rear wheels.

There were thirty-nine stops in all, and only eleven of these were for tires. The other twenty-eight went to patch up mechanical difficulties.

As a matter of habit, Resta's one pit stop was made in record time for the meet. He changed a right rear and took on gasoline in 28 seconds. This, however, was a plain slide-in-and-roll-out-again stop, and was neither as remarkable nor as thrilling as Aitken's only pit visit. The dethroned A. A. A. championship driver, with a lead over Resta of only half a lap, was apparently over-enthusiastic to get his right rear tire changed and headed for the pits at a terrific speed. His slewing started when he was opposite the judges' stand and he rocked from one side to the other until he got in front of his pit and then slid sideways up the track for a distance of close to 100 feet. The car switched



From left to right in their order, Aitken, de Palma, Resta and Hughes. Aitken led at the end of this, the second lap. De Palma took the lead at the third, making a 2-mile spurt

Specifications and Equipment of the Cars Which Competed in Chicago Race

CAR	DRIVER	BORE AND STROKE	DIS.	CARBURETER	MAKE OF PLUGS	VALVES NO.	VALVES LOCATION	VALVES OPERATION	OIL	TIRES	WHEELBASE	WHEELS
2	Maxwell	Rickenbacher.	3.75 x 6.75	298.2	Miller	K-L-G	16	Head	2 O. H. shafts	Oilzum	Silvertown	106	Houk
3	Maxwell	Henderson	3.75 x 6.75	298.2	Miller	K-L-G	16	Head	2 O. H. shafts	Oilzum	Silvertown	106	Houk
10	Peugeot	Aitken	3.65 x 6.65	274.0	Zenith	K-L-G	16	Head	2 O. H. shafts	Oilzum	Goodyear	105	R-W
14	Duesenberg	Buzane	3.75 x 6.75	298.2	Miller	Rajah	8	Side	Vertical rockers	Oilzum	Silvertown	104	R-W
15	Erbes	Gable	3.63 x 7.19	289.3	Miller	K-L-G	16	Head	2 O. H. shafts	Sexton	Silvertown	98	R-W
13	Crawford	D'Alene	3.75 x 6.75	298.2	Miller	Rajah	16	Side	Vertical rockers	Oilzum	Silvertown	106	R-W
8	Crawford	Klein	3.75 x 6.75	298.2	Miller	Rajah	16	Side	Vertical rockers	Oilzum	Silvertown	106	R-W
4	Peugeot	Resta	3.66 x 6.65	275.0	Miller	K-L-G	16	Head	2 O. H. shafts	Oilzum	Silvertown	100	R-W
19	Hoskins	Hughes	3.75 x 6.75	298.2	Miller	Rajah	16	Side	Vertical rockers	Mobiloil	Silvertown	105	R-W
2	Ogren	Burt	3.75 x 6.75	298.2	Miller	Rajah	8	Side	Vertical rockers	Castor	Silvertown	105	Houk
6	Premier	Lewis	3.65 x 6.63	274.5	Miller	K-L-G	16	Head	2 O. H. shafts	Oilzum	Goodyear	105	R-W
11	Premier	Galvin	3.65 x 6.63	274.5	Miller	K-L-G	16	Head	2 O. H. shafts	Oilzum	Goodyear	105	R-W
18	Hudson	Vail	3.50 x 5.00	288.6	Hudson	Rajah	12	Side	L head	Veedol	Silvertown	105	R-W
17	Duesenberg	Milton	3.75 x 6.75	298.2	Miller	Rajah	16	Head	2 O. H. shafts	Oilzum	Silvertown	105	R-W
21	Duesenberg	Devore	3.75 x 6.75	298.2	Miller	Rajah	16	Head	2 O. H. shafts	Oilzum	Silvertown	105	R-W
1	Peugeot	Wilcox	3.65 x 6.65	274.0	Zenith	K-L-G	16	Head	2 O. H. shafts	Oilzum	Goodyear	105	R-W
5	Duluth special	Rawlings	3.75 x 6.75	298.2	Miller	A. C.	16	Head	2 O. H. shafts	Mobiloil	Silvertown	106	R-W
9	Peugeot	De Palma	3.65 x 6.65	274.0	Miller	.....	16	Head	2 O. H. shafts	.....	Goodyear	105	R-W

All cars reporting such equipment had Hartford shock absorbers and Boyce Moto-Meters. Three cars were without Moto-Meters. All used Bosch ignition except Vail's Hudson, which used Delco, and all had aluminum pistons except Aitken, Gable and Resta, who used Leavitt, Miller Alloy and Alloynium, respectively.

backwards as it finally came to a stop and to the surprise of everybody Aitken threw into low and shot into his pits in the wrong direction. The tire was changed with the car wrongside out, so to speak, and with all the attendant excitement the pitmen gave him a new tire and sent him off again in 30 seconds. He was obliged to swing a semi-circle across the track to get into the race again and the whole exciting proceeding lost him the lead.

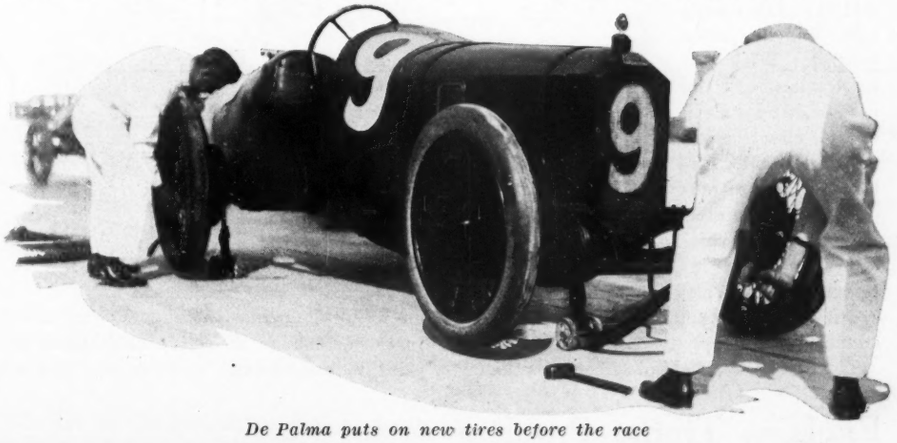
The Crawford pit, with one of its cars bearing No. 13, suffered about as disheartening a climax ever presented in a speedway race. D'Alene's fireworks were pure carelessness. He drove into the pits for a supply of gasoline and the supply intended for the tank was poured promiscuously all over the back end of the car, part of it going over the tail of the exhaust pipe and igniting from the exploding gases of the motor, which was left running.

D'Alene took his fire-blackened car back into the race with a new mechanic substituted for the one who was nearly cremated and drove a few more laps when a connecting rod let loose and he was out for good.

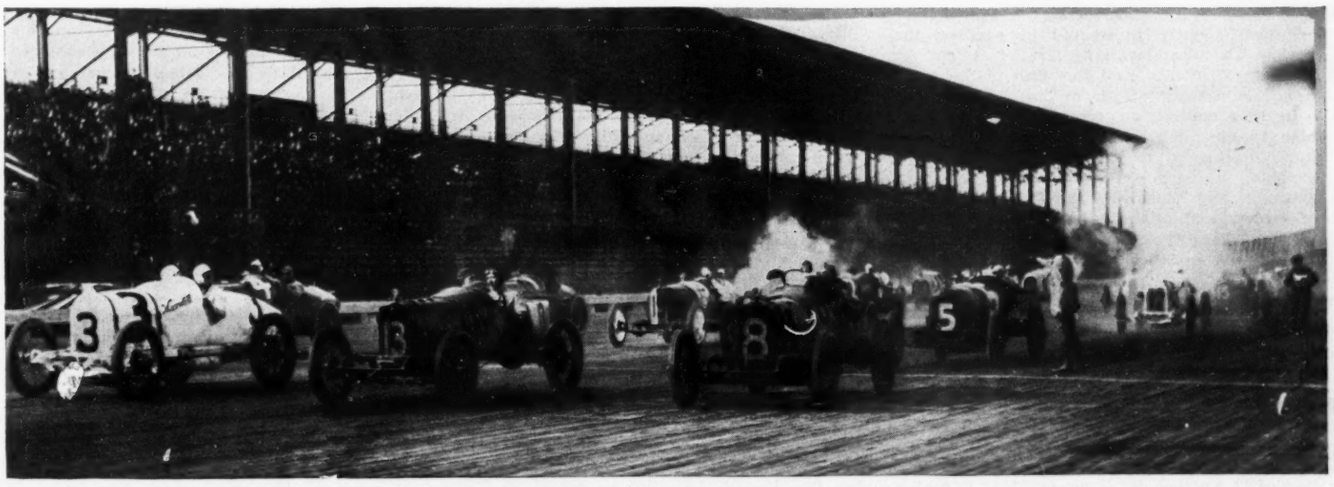
On the same lap Kline's Crawford split a crankshaft and the havoc it wrought in the motor is probably beyond repair. The whole crankcase assembly was literally disemboweled.

The fire in Devore's Duesenberg can also be attributed to carelessness. He stopped for a tire and the motor did too. The mechanic tried to crank the motor again, and as it would not start he opened the hood and attempted to tickle the carbureter. Instead of performing this, he knocked off the cap of the float chamber, the float shot out and the explosive fluid poured itself generously over the car and track. Over 2 minutes were consumed in trying to put the cap back on and gasoline was pouring over the track all the time. When the assembly was finally completed, and the motor was cranked, the gasoline-loaded cylinders backfired through the carbureter and started the fireworks. Fortunately it all took place directly in

(Concluded on page 31)



De Palma puts on new tires before the race



Flying start, Klein, D'Alene, Henderson and Resta in front row

Five Years of the Eno System

Comment from Various Sources Express Favor of Uniform Traffic Regulation

MEMPHIS, Tenn.—Editor Motor Age—As far back as July, 1911, Memphis, Tenn., adopted traffic regulations essentially the same as those embodied in the Eno System. Prior to the adoption of this system, Memphis had an ordinance which did not provide for the control of heavy traffic and now after 5 years under sane and consistent regulation, greater strides toward Safety First are noted.

Up to the time the Eno System was put in force in Memphis, car operators and chauffeurs were not under police control. With the institution of the new ordinance, every effort was made through stationing traffic officers, both mounted and on foot, at various busy street intersections to bring about greater convenience for all classes of traffic.

The only kind of a semaphore on some of our most dangerous streets.—Louisville Times

The 8-foot stop behind street cars taking on or discharging passengers was added to the ordinance in 1915. This clause applies to motor cars, motorcycles, and all horse-drawn vehicles, and the penalty for violation is not less than $1 nor more than $10. Memphis has also put plain-clothes men to watch for traffic violations and to enforce the ruling requiring every chauffeur to have a license and registered at police headquarters.

Not until this year was a limit put on the time a motor vehicle may remain on the busiest streets. Cars are not allowed on certain thoroughfares, either with or without the driver, more than 15 minutes. Drivers who leave their cars longer than this are warned the first time, and second and future offences call for a fine of from $1 to $10. Since the introduction of the Eno System, there has been very little difficulty in handling traffic in Memphis, although the city has over 200,000 population.—Leon S. Oppenheimer.

Explains Traffic Problem

ST. LOUIS, Mo.—Editor Motor Age—I have been greatly interested in reading the article on "Standardizing Traffic Rules" by William K. Gibbs, and the Eno traffic ordinance in a recent issue of Motor Age.

In this connection would it not be well also to consider some of the reasons why the handling of traffic has become such a problem in large cities? Improper street planning and especially the improper design of streets and street intersections has contributed largely to the difficulties of the traffic problem. An article on this phase of the question, or simultaneous consideration of the same together with the discussions of the methods of handling traffic, would appear to be pertinent.

In Figure No. 12 accompanying the article referred to is shown a complicated street intersection where the handling of traffic could be greatly facilitated by means of a better design. The route of vehicular travel indicated passes directly through the intersection of two street car lines, crossing one at a very flat angle—obviously a most undesirable thing to do. All flat angular intersections should be eliminated and traffic handled either by a gyratory system or by right-angle intersections only.

In the article also little reference has been made to the handling of pedestrian traffic. Since the object of all vehicular traffic regulation is to prevent accidents to pedestrians primarily, as much consideration should be given to pedestrian movement as to vehicular movement at street intersections. A simple and effective regulation could profitably be adopted at all the right angle street intersections where traffic moves alternately on one street and then on another, that all pedestrian movement should be simultaneous with vehicular movement. If, for instance, at the intersection of two busy streets, one running east and west and the other north and south, pedestrian and vehicular traffic should first move on the north and south street for a given interval and then stop completely, while vehicles and pedestrians both move in the opposite direction. Many of the accidents at busy street intersections are due to the mingling of pedestrians and vehicles.—H. Bartholomew, City Plan Engr.

Indorses the Eno Plan

ST. PAUL, Minn.—Editor Motor Age—I have read your article on "Standardizing Traffic Rules and Ordinances" very carefully and have the following comments to make:

I agree heartily with you, that a uniform system of regulation of vehicular traffic should be adopted throughout the country, and this ordinance of Mr. Eno's covers the situation very well.

I believe, however, that the individual semaphore signal system, at crossings, is the best, as traffic will move much more quickly in response to these signals than to whistle or arm signals, in my estimation. These semaphores could be lighter at night, or removed should traffic not warrant their use. The traffic at each crossing should be handled individually, and not as under the block system.

The system of marking the crossings for pedestrians is very good and has been suggested to our traffic department for adoption. I do not agree with Mr. Eno's idea of setting back the lines of this crossing

from a continuation of the sidewalk approximately to the building line, as in most cities you will find that the fire hydrant, and frequently the mail boxes, would then be placed in the middle of the walk, and sometimes at both ends. When a vehicle approaches this crossing the driver is compelled to stop at the near side of the walk, so marked, and the building at his right would shut off all view of the traffic on the cross street on his right. Traffic would also be stopped at such a distance from the center of crossing that much time would be lost in making the crossing after the signal is given by the traffic officer. Any driver using the ordinary amount of care and diligence could make the turn on to the cross street without encroaching on the designated walk.

I also believe that the near side stop regulation for street cars should be included in this ordinance.

In the headlight ordinance now in effect in St. Paul the lights of your machine are regulated so that you will find the light entirely adequate for travel in the country as well, at any speed conducive to safety.

Relative to pedestrians alighting from a street car and passing behind the car to the opposite side of the street, I contend that pedestrians should be taught to step to the nearest sidewalk from a street car as soon as possible. As vehicles are prevented from passing a street car which is discharging passengers, they are secure from injury. They could then walk to the regular crossing and cross to the opposite side of the street. I believe this would eliminate a great danger of accidents now resulting from pedestrians not being careful when they cross the street from behind a street car.—F. H. Murray, President Automobile Club of St. Paul.

Anent Uniform Traffic Laws

CLEARWATER, Fla.—Editor Motor Age—I spent June, July and August motoring through sixteen states and the District of Columbia, doing about 7,000 miles. I passed through more than 1,000 cities, towns and villages and was never warned by a traffic cop or arrested by a speed-trappist.

I got through with a clean record by doing in "Rome as Romans do." I paid little attention to the warning boards at the entrance to towns, which ran from 4 miles an hour to 100—the latter was a feeble attempt to be funny by the village Georgeade.

I never passed a car in a village and thus had an alibi in case of arrest, namely: that I was following the trend of traffic. I parked as others parked, and if obliged to run corners or turn about, turned at street intersections with warnings and hand signals, just like I were in New York or Chicago. This made the marshall feel real chesty—that I thought his little old low-rambling sheet-iron village was some pumpkins. You see, in traveling you must never get uppish and think because the town is small that it is a jay town and you can violate traffic laws and decency with impunity.

When there were no cars to follow into a town, or to designate how you should move, I would put up on the soft pedal and go so slow that I could count up how much money each merchant had in his cash register, or the current price of butter and eggs.

I found Washington, D. C., the city of mystery, so far as traffic laws were concerned.

Each traffic cop had a different signal. There were a few semaphores, and these were all different. Some were real dignified. Instead of Stop and Go, they read Stop and Proceed. At night these semaphores had different lights or no lights. Some used green and white and some red and white, and some a blank. Washington is the poorest lighted city in America. Yet they will not allow you to use spot lights thrown in front of the car—nothing but the dimmest dimmers go. I tried night riding on just one occasion. I drove over the speedway at the excessive speed of 6 miles an hour, because a procession some 10 miles long ahead of me was traveling at that rate. When I got out of the dead march I cut across the Mall, and ran into a pile of crushed rock that some other car had mussed up, turning over the red lantern. Then I ran into a manhole, and swiped a couple of trees and a car wrecked by the roadside. No sir—no spot light in Washington. It might expose some of the doings of Congress.

I believe Detroit has the best traffic laws of any city in the United States. They seemed most intelligent to me, a stranger within that city.

The most annoying feature of motoring is the getting in and out of cities, and even small towns. Ninety per cent of routing worry is had right within corporate limits. There are few towns intelligently marked, and if they are the markers are lost in a maze of other signs.

Motor Age is to be congratulated on its campaign for uniform traffic laws and uniform markers.—W. B. Powell.

Psychology and the Pedestrian

Denver Adopts Plan to Prevent Jay-Walking

HOW to limit the erratic movement of the pedestrian to his proper paths long has been a problem which has defied police departments. If a pedestrian steps from the sidewalk halfway between corners, or cuts through a busy crossing with sublime indifference to the signals of the traffic officer he considers that he is only acting within his constitutional rights, but if, in so doing, he narrowly escapes collision with a motor car or other vehicle, some interesting remarks on reckless driving may be heard.

Psychology Solves Problem

Since the inauguration of Mayor Robert W. Speer, in office in Denver, the police authorities there have resorted to psychology to solve this annoying habit. The results have been gratifying.

Instead of shouting a gruff command the traffic officer now steps up to the offender, hands him a small card and turns away without remark. Upon this card, in red ink is printed the following courteous suggestion:

NOTICE TO PEDESTRIANS

PLEASE DO NOT
- Cross the street diagonally.
- Cross the street between blocks.
- Visit with the traffic officer.

In the lower left-hand corner, over the words "The Right Way," appears the diagram of a street crossing with arrows indicating the passage of pedestrians along the lines of the sidewalks extended.

In the lower right-hand corner appears, under the words, "The Wrong Way," a diagram of a street intersection with dotted lines crossing diagonally from corner to corner. In the center Safety First appears in a red circle.

When the pedestrian receives this card he is surprised. The natural impulse is to look at the card and, the traffic officer having walked away, he finds no chance for an argument. Where a hurried command, delivered verbally, would pass in one ear and out the other, or arouse irritation, the printed card makes a more lasting impression.

That the psychological effect of the cards is properly gauged is attested by the fact that traffic officers report that pedestrians have received the warnings in good spirit and have noticeably corrected their shortest path habits.

Before the cards were issued the city council had passed an ordinance providing fines for violations of the traffic regulations by pedestrians. This made no visible impression upon foot passengers.

Uses Diplomacy

Manager of Safety Dewey C. Bailey is an advocate of diplomacy, and when that fails he tries more diplomacy. Habits of careless drivers also have been the cause of another card.

Whenever a machine is found violating certain regulations a tag, printed in red ink, is tied to the steering wheel, with the particular offense of which the owner is guilty ringed. This silent request has had a most salutory effect. The card is:

SAFETY FIRST DON'TS

D—Park vehicles on Fifteenth, Sixteenth or Seventeenth streets with right wheels over 1 foot from the curb.
O—Leave vehicle within 10 feet of water hydrant.
N—Back vehicle without giving alarm.
T—Leave your engine running without driver.
S—Leave your vehicle in front of theater entrance.

GLARING HEADLIGHTS A NUISANCE

Washington, D. C., Oct. 14—Right-of-way and glaring headlights are the two things which stand out ahead of everything else in the uniform traffic problem, according to Chairman O. I. Yellott, of the A. A. A. legislative board, which has taken up this large subject in a determined effort to bring about a country-wide understanding.

Car Shortage Cripples Motor Shipments

Manufacturers Forced to Adopt Unusual Methods to Keep Movement Close to Normal—Various Equipments Used

DETROIT, Mich., Oct. 14—Using flat cars, Arm's palace horse cars, box cars and any other sort of a freight car with a 6-foot door, manufacturers of motor vehicles in Detroit and other cities are attempting to meet the serious shortage of freight cars suitable for transportation of motor vehicles, and they are finding it a difficult task.

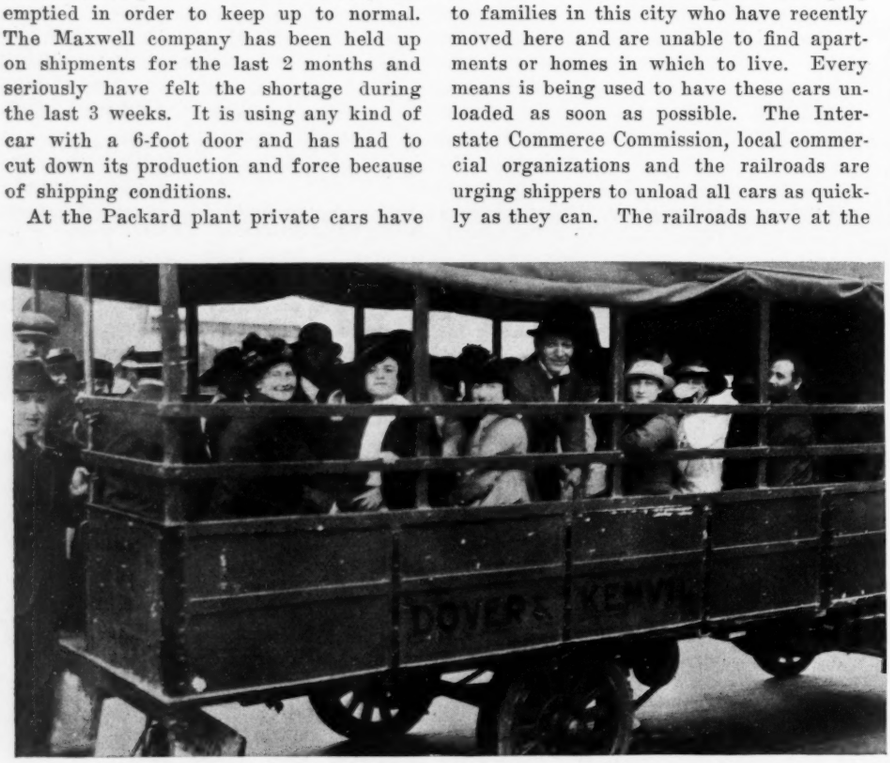
Whether the blame for the shortage belongs to the 213,078 cars manufactured this year as compared with 139,829 of 1915, or to the vast grain movements now taking place, or to the delay in unloading of freight cars, or as many maintain, to the shortage in trackage and motive power, is not yet clear, but manufacturers are becoming pessimistic over the outcome and predict that even greater difficulties are sure to arise within the next few months.

Interviews with a number of motor car makers in Detroit disclose that many are now suffering to such an extent that they have been forced to cut down their production. At the Ford plant the traffic department reports that though it is not suffering to great extent as yet, it has been forced to use ordinary box cars and to reload freight cars as soon as they are emptied in order to keep up to normal. The Maxwell company has been held up on shipments for the last 2 months and seriously have felt the shortage during the last 3 weeks. It is using any kind of car with a 6-foot door and has had to cut down its production and force because of shipping conditions.

At the Packard plant private cars have been leased to care for the shipments and up to the present the company has been able to cope with the situation though the traffic department states that the situation looks extremely serious for the future. Cadillac has suffered the greatest inconvenience through the western equipment and though running light on production at present has had to use flat cars for the last 2 weeks. The Studebaker company has had several tieups. It is shipping about three times as many cars at present as 3 years ago and is attempting to relieve the shortage by loading foreign cars to local points as far as possible and also pounding at the consignees for prompt release of cars as quickly as it knows they are tied up. The Hudson company has leased many private Arm's palace horse cars which are relieving it for the present, but officials say shipping conditions are constantly becoming worse and take a pessimistic outlook. Many other companies report similar troubles.

Many plans are under consideration and operation for the relief of congestion. There are at present about 9,000 cars lying idle in the Detroit freight yards which are filled with household goods belonging to families in this city who have recently moved here and are unable to find apartments or homes in which to live. Every means is being used to have these cars unloaded as soon as possible. The Interstate Commerce Commission, local commercial organizations and the railroads are urging shippers to unload all cars as quickly as they can. The railroads have at the present time, 10,000 new motor vehicle cars in operation as compared with a year ago and have 8,000 additional under construction, of which 5,000 are expected to make their appearance this winter.

The railroads are attempting to prevent delay of unloading of cars by means of a higher rate of demurrage which they are trying to establish, and which they believe will force shippers to unload. They claim that there should be a progressive charge making it $1 per day per car for the first 3 days; $3 per car per day for the next 3 days and $5 per car per day for each succeeding day. It is likely that tariffs soon will be filed to cover this schedule. At the present time reports show an approximate shortage of 100 cars per day in Detroit alone.



ONE RESULT OF NEW YORK'S GREAT TRACTION STRIKE—With the advent of the traction strike in New York, owners of motor trucks sent them to the points most affected, to carry fares to and from their places of business. The photo shows one of these trucks doing a good business.

NEW HAYNES FOR OLD

Indianapolis, Ind., Oct. 16—Samuel M. Ralston, governor of Indiana, last Thursday afternoon presented James E. Howard, Jeffersonville, Ind., the winner of the Haynes Automobile Co.'s "oldest running car contest," with a 1917 Haynes twelve for his 1897 Haynes two-cylinder car.

The presentation was made at the coliseum at the Indiana State Fair grounds, and was preceded by the Indiana state centennial good roads parade, which was reviewed by President Wilson.

Elwood Haynes, Kokomo, Ind., maker of one of America's first cars, was seated on the platform with President Wilson. When Governor Ralston declared that the car is back of the good-roads movement, and that it was Mr. Haynes who gave America one of its first cars, the crowd that filled the coliseum yelled for Mr. Haynes.

Governor Ralston lead Mr. Haynes to the front of the platform, and the crowd arose and cheered, giving him an ovation that equaled that extended to the president.

The old and new cars were on exhibition outside of the coliseum entrance, the old car having been driven from the city entirely on its own power. It carried passengers and made eighteen miles an hour without difficulty. The tires on the old car were replicas of the Diamond single-tube tires, with which the car originally was equipped and ran on for nearly 20 years, while Silvertown cords graced the new car. The car which won the Haynes contest was built 3 years after the first car. In the contest to find the oldest car, eight Haynes cars built before 1900 were found, four of them being of the 1897 model.

Police Schools for Car Identification Plan

King Company's Technical Expert to Repeat Recent Chicago Lecture in Several States

DETROIT, Mich., Oct. 14—Irvin D. Rocap, technical expert for the King Motor Car Co., recently gave a lecture on car identification to 200 traffic officers and 350 detective sergeants in Chicago which is to be duplicated in cities in many sections of the country.

The lecture in Chicago was given under the direction of Captain Collins and Chief Healey, of the police department, in an effort to overcome the increasing number of stolen cars. During the last 12 months, 2,300 cars have been stolen in Chicago of which more than 700 have never been recovered and it was to educate the police in all the methods of car identification that Mr. Rocap directed his lecture. His instructions met with the approval of the chief of the department who has ordered a number of pamphlets printed incorporating the lectures and also an identification blank devised by Mr. Rocap which bears suggestions for gathering sufficient information about stolen machines to insure their identity if found.

In the past week the King company has had requests from Los Angeles, Louisville, Philadelphia, Denver, Minneapolis and Milwaukee for lectures similar to the one given in Chicago and Mr. Rocap, commencing October 30, at Los Angeles, will make a tour of these and other cities desiring to include police schools in their departments.

The lecture includes all possible means of identification. Taking the subject of car names he instructs the police where the name may be found, the general outline and appearance of all makes of cars and the various models, showing that the model or appearance can usually tell the year the car was built. He tells of the factory or serial number, state and city license numbers, top numbers, motor, steering gear, carbureter, front axle and rear axle, radiator, ignition-make, clutch, gearset, tires, speedometers, tire pump, lighting system, starting system and shock absorber numbers and how and where to find them.

The question of describing a car is taken up and the police are told of ways to determine the number of cylinders, the parts of a motor, the true color of the body and wheels, the make of carbureter and radiator, and the type of clutch.

CAN'T REFILL PREST-O-LITE TANKS

Indianapolis, Ind., Oct. 16—Judge A. B. Anderson in federal court last week granted a permanent injunction in behalf of the Prest-O-Lite Co. against Orion K. Stuart, of the Sun Lite Gas Co., Alexandria, Ind., which forbids the latter from refilling Prest-O-Lite tanks. The decision was considered important because the refilling of Prest-O-Lite tanks threatened seriously the company's business. Judge Anderson threatened Mr. Stuart with a jail sentence when the latter asked the court if he owned stock in the Prest-O-Lite Co.

REO BUILT 2,551 TRUCKS

Lansing, Mich., Oct. 14—The Reo Motor Truck Co., recently amalgamated with the Reo Motor Car Co., in its fiscal year of 1916 produced 2,551 trucks, valued at $3,521,000. This was an increase of 33.38 per cent over the fiscal year previous.

MOTOR STEELS SCARCE

New York, Oct. 4—Soft steel bars are much in demand, some 50,000 tons of this stock being demanded in Detroit. Instead of steel salesmen peddling their wares among the different plants, as in former times, steel buyers are trying to get their orders accepted. Some contracts for 15,000, 8,000, 6,000 and 3,000 tons are waiting.

HINTS ON FIRE PREVENTION

Boston, Mass., Oct. 14—Suggestions as to what motorists can do to aid in making garages safer, and in lessening the dangers from fire in structures where motor cars are handled have been made by the fire prevention commissioner. He says that many fires are the result of carelessness, and not paying attention to the laws governing such structures.

First he requests that motorists make a conscientious inspection of the garage to determine whether it conforms with the state and with the gasoline regulations.

Next he would have them observe carefully during the day the conduct of the garage to determine whether employees use gasoline in washing parts.

Make a special effort on that day, he says, to the end that nobody shall smoke in the garage. The act of smoking in the garage involves a fine of $20, and is ground for the revocation of the garage license.

Then he asks to note whether in any case the tank of car owners is being filled while the engine is running. This is a dangerous practice and is liable to cause a bad fire or explosion. Caution the employees that if this is done they may lose their job.

Be sure that "No Smoking" signs are properly and conspicuously displayed in the garage.

Write a letter, he suggests, to the fire prevention commissioner calling his attention to some prevailing danger in the management of garages and storage of gasoline, or to some instance, if there be any, where the garage and gasoline regulations might safely be broadened for the benefit of the garage owners.

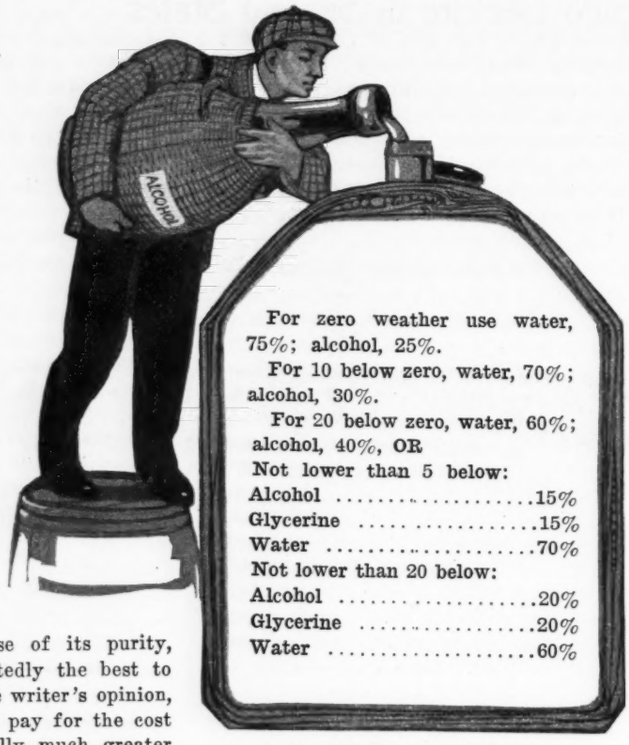
And in conclusion he says if motorists can carry out this line of action for fire prevention day, do so for every day in the year and they will be doing their part to lower the number of fires and reduce the enormous fire loss.

BELGIAN ARMY NEWLY EQUIPPED—First official Belgium photographs to arrive in this country, showing the new equipment of the Belgian army in preparation of their great offensive which will be launched shortly. Photo shows the Belgium armored cars with machine guns.

Jack Frost and the Radiator

Mixtures That Stay-off Freezing

A CENSUS of the opinions of motor car manufacturers as to the value of various anti-freeze solutions for use in winter driving reveals universal recommendation of alcohol and glycerine. Calcium chloride, in fact, all soluble salts are tabooed, because of their harmful action on the metal. In a few instances warning is given against the overliberal use of glycerine because of its disintegrating action on the rubber hose connections.



For zero weather use water, 75%; alcohol, 25%.

For 10 below zero, water, 70%; alcohol, 30%.

For 20 below zero, water, 60%; alcohol, 40%, OR

Not lower than 5 below:

Alcohol 15%
Glycerine 15%
Water 70%

Not lower than 20 below:

Alcohol 20%
Glycerine 20%
Water 60%

Alcohol recommendations include the wood, grain and denatured varieties with advocates for each. Because of its purity, grain alcohol is undoubtedly the best to use, but its worth, in the writer's opinion, is not enough greater to pay for the cost of it which is universally much greater than the wood and denatured varieties.

Included among those recommending simple alcohol solutions are King, Buick, Winton, Maxwell, Mitchell, Willys-Overland, Kissel, Marmon, Peerless, Haynes and Case.

Glycerine Advocates

Advocates of the combination of glycerine and alcohol are: Packard, Hudson, Chalmers, Studebaker, Dorris, Locomobile, Oakland, Cadillac, Reo and others. Many of these recommend the simple alcohol solution also.

Alcohol has one undesirable feature and that is its evaporating proclivities. The glycerine addition is primarily intended to hold the anti-freezing solution in the water longer and there is no doubt but what it accomplishes that end.

Interesting figures are offered by the Locomobile Co., of America, in the form of curves, one for the freezing temperatures of alcohol solution and one for the boiling temperatures of various anti-freeze solutions. In Fig. 2 two curves are given, one for glycerin and one for wood alcohol and glycerine in combination. It will be noted that, for equal volumes, the former gives a much lower temperature.

It is important to know the boiling temperatures of anti-freezing solutions inasmuch as there are, frequently, very warm days in the middle of the winter, or an engine may be allowed to stand with the

By Wallace B. Blood

motor running for a considerable time during which it will heat considerably. If not kept below the boiling point the anti-freeze product, whatever it may be, will vaporize and be lost, reducing the low temperature capacity of the water system. By referring to Fig. 1 it will be noted that the boiling temperatures of all except the glycerine increase with the weakness of the solution, or in other words, decrease with the strength of the solution while glycerine increases with the strength of the solution. It should be noted that wood alcohol boils as low as 140 degrees with solutions of 47 per cent and greater while it will boil at 170 at all strengths above 30 per cent. This chart shows the care necessary in using these solutions, as 170 or even 180 are very common temperatures.

In recommending anti-freeze for Marmon cars the following generalization is made: "Several substances may be used, the most common of which are wood or denatured alcohol, glycerine and calcium chloride and other salts. All salts are dangerous on account of their action on metal; and glycerine, while it has the advantage of not evaporating, has a certain amount of action on the rubber hose connections which must be looked out for. Alcohol, therefore, is the safest thing to use. The Marmon 32 circulating system contains 5 gallons, the 41, 7 gallons and the 48 model uses 8 gallons. Evaporation will be mostly from the alcohol, so that, in order to retain the solution properly, it must be filled with 50 per cent alcohol throughout the cold winter weather."

Cadillac states that a solution of refined glycerine and water is recommended and gives the following table indicating the freezing points of glycerine, the proportions being given by volume:

Glycerine	Water	Freeze at
35	65	10 above
40	60	6 above
45	55	3 above
50	50	zero
55	45	2 below
60	40	4 below

Kissel recommends a solution of 25 per cent alcohol and 75 per cent water. Willys-

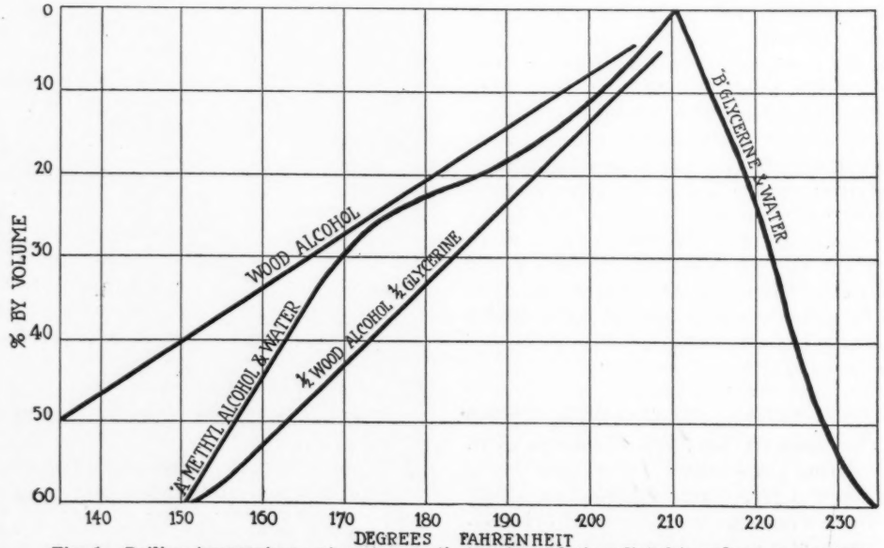


Fig. 1—Boiling temperatures of various anti-freezing solutions listed in volume, percentage and degrees Fahrenheit

Overland, Inc., offer alcohol and water formula solutions which are the only anti-freezing solutions advocated for use in Overland cars. The formula list is:

Water	Alcohol	Freezes at
95%	5%	25 above
90	10	18 above
85	15	11 above
80	20	5 above
75	25	2 below
70	30	9 below
65	35	15 below
60	40	23 below

Winton advises the use of denatured alcohol and not wood alcohol. Solutions with from 10 to 40 per cent alcohol are advised depending on the temperature which is peculiar to the locality in which the car is driven.

If you live in a place where the temperature occasionally drops as low as 20 degrees below zero it is a worthy precaution to keep a solution, in the case of alcohol about 40 per cent, which will not freeze at this exceedingly low temperature. You may put your car away in the evening with the thermometer at 5 degrees above and wake up in the morning to find it 20 below. If your radiator solution is mixed to take care of the 5 degrees above temperature, your cooling system is going to freeze. Cracked cylinders and split radiator tubes cost a lot more than alcohol, or glycerine, whatever compound you use.

Buick has forwarded the following advise to its dealers:

To prevent freezing at zero use 1 gallon of wood alcohol or 5 quarts of denatured alcohol for the D-6-44-5, and 5½ quarts of wood alcohol or 7 quarts of denatured for the D-6-54-5.

To prevent freezing at 20 degrees below zero use 6 quarts of either wood or denatured alcohol for the D-6-44-5 and 9 quarts of either wood or denatured for the D-6-54-5.

To prevent freezing at 35 to 40 degrees below zero use 2 gallons of either wood or denatured alcohol for the D-6-44-5 and 11 quarts for the D-6-54-5.

The following advice is given by Buick: "In using anti-freeze mixture, first drain the entire cooling system, then wash out thoroughly with clean water. Add the proper amount of alcohol and fill the radiator to the usual level with clean water. After filling be sure to run the motor a few minutes to mix the solution before leaving the car."

The only anti-freezing solution which Packard recommends is the glycerine-alcohol solution. Two formulas are given.

For a temperature not lower than 5 degrees below zero:

Alcohol .....15 percent
Glycerine .....15 percent
Water .....70 percent

For a temperature not lower than 15 degrees below zero:

Alcohol .....17 percent
Glycerine .....17 percent
Water .....66 percent

About 8½ gallons of solution are required for the Packard twin sixes. An item of Packard advice is: "If the radiator should become frozen on account of not containing the proper solution, do not run the motor until full circulation has been started. It is not possible to thaw a frozen radiator by running the motor, whereas, by doing so the current of air caused by the fan may cause it to freeze even more solidly." This is applicable to any make of car.

Yet another angle of the matter of mixing alcohol, glycerine and water appears in the Studebaker recommendations. Tests in the Studebaker experimental shops resulted in the compilation of the following table:

Alcohol	Glycerine	Water	Freezes at
3	2	95	28
6	4	90	25
9	6	85	20
12	8	80	15
18	12	70	–5
21	14	65	–10
24	16	60	–15

As previously stated, alcohol evaporates rapidly while glycerine remains in the cooling system. In this regard Studebaker advises as follows: "As the contents of the radiator have to be added to, pay no heed to the glycerine, but add according to the following proportion: Alcohol, 25 per cent; water, 75 per cent."

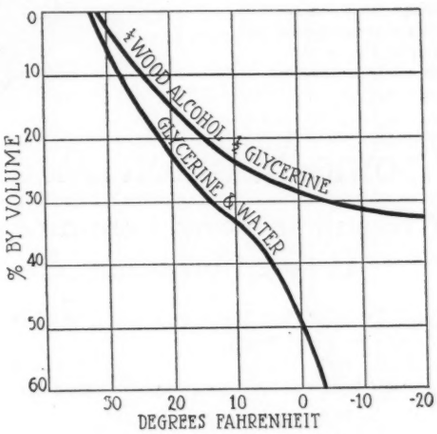


Fig. 2—Freezing temperatures of two anti freezing solutions. The vertical figures give the percentage of mixture by volume

Chalmers is an advocate of a solution of wood alcohol, glycerine and water. For temperatures not lower than 5 degrees below zero 15 per cent alcohol, 15 per cent glycerine and 70 per cent water is advised. For temperatures not lower than 15 below, 17 per cent alcohol, 17 per cent glycerine and 66 per cent water is the proportion given. About 6¾ gallons are required for the Chalmers model 35. Solutions of practically the same proportion are advocated by Hudson.

Case recommends denatured alcohol in preference to anything else. According to this manufacturer wood alcohol is not desirable on account of the probability of its containing corrosive acids. Case cars require 4 quarts of alcohol for 20 above zero, 7 for 10 above, 10 for zero, 14 for 10 below and 17 quarts for 20 below zero, according to the manufacturer's statement.

Specific gravity readings are a simple means of finding out the proportion of the alcohol solution. Case gives specific gravity figures as follows: 20 above zero, .98; 10 above, .964; zero, .949; 10 below zero, .935; 20 below zero, .916. These readings may be made with a hydrometer.

King gives hydrometer readings as follows: .969 for zero, .963 for 7 below, .957 for 15 below, .951 for 22 below. This applies to wood alcohol and accounts for the variation from the above.

Mitchell is an advocate of grain or denatured alcohol, while Oakland believes in the addition of a small amount of glycerine. The recommended Oakland solution consists of half denatured alcohol and half water with 4 to 6 ounces of glycerine added.

Maxwell strongly recommends the use of grain alcohol, but gives an option of denatured inasmuch as it is very much cheaper. Haynes is an advocate of alcohol with solutions from 95 per cent water to 5 per cent alcohol for 25 degrees above zero, and 60 per cent water and 40 per cent alcohol for a freezing point of 23 degrees below zero.

The summary of it all seems to show a preference for denatured alcohol, which, fortunately, is cheaper in most localities than wood or grain alcohol, and an addition of a small amount of glycerine to reduce the evaporation rate of alcohol. Regarding the glycerine, the unbleached variety which may be procured at practically any drug store, is cheapest and best.

This article considers only the anti-freezing solutions which the car owner may compound himself. There are a number of compounds, ready mixed, on the market which will be described in another article which will appear in the near future in Motor Age.

ST. LOUIS FASHION SHOW

St. Louis, Mo., Oct. 14—A pretty girl, wearing a white felt hat with a brilliant red band, a brilliant red sport coat over a dainty white frock and driving an olive-green Apperson roadster was the undoubted favorite in the Automobile Fashion Show held on the Agricultural Fair race track last week. She was Miss Nell Tracy and her prize was a diamond and platinum bracelet, valued by the promoters at $300. There never was a question but that she was the favorite with the crowd despite the lack of harmony between her coat and the paint of her car. All of the other women drivers dressed in harmony with the color of their cars.

Fifty-six women known to the best society in the city entered the contest. The foreign consuls in this city were the judges.

From the Woman's Viewpoint

No doubt this illustration seems, on first glance, that of a troop embarked in motor cars on a march to the front "somewhere or other," with flags flying and a drum somewhere in hearing. Mrs. Burke and Miss Richardson lead the procession, which has turned out to greet them on their transcontinental journey in the interests of woman suffrage

What Some Women Are Doing

Suffrage and the War Result in New Feminine History—Hallowe'en Is Not Forgotten

NO DOUBT when Mrs. Alice Snitjer Burke learned to drive her car she did so without thought that she would in the summer of 1916 make a grand circuit of the United States, in which she would put to good use that knowledge. But she did make the circuit and with her was Miss Nell Richardson, also of New York, who likewise was willing to make the circle thus.

Two suffrage pilgrims for a cause in which they are both deeply interested, they left New York City April 6 and returned the latter part of September. No Pullman car, or even chair car, for them when they could make their own schedule and govern their own mileage. But a Saxon, just big enough for two, with room behind for a scanty wardrobe and no place for a chauffeur.

Women Motor Cross-Country

It is becoming customary for feminine as well as masculine motorists to cross the continent and give to the rest of us poor-stay-at-homes the thrill of hearsay. There is the athletic young woman, the moving picture actress and the adventuresome who attempt — and accomplish — this journey, but these two are of different caliber from those who have hitherto made the transcontinental drive—and they made more than a transcontinental drive, for their tour included the south and north as well as the east and west.

Both Mrs. Burke and Miss Richardson are workers for woman suffrage. They believe in it to such an extent that they undertook this trip to further spread the news, so to speak. From New York City they swung down to New Orleans, where they were April 27. From New Orleans they followed the roads out to Los Angeles, stopping there June 4, and then went up By September 12 they were in Chicago, and 3 days later in Detroit, from which place they went on to New York City.

The story of their adventures, aside from the real mission of their trip, is a full one. to San Francisco for the 14th of June. A month later they reached Seattle, and then began the journey back to New York.

It took them until September 1 to make the state of Minnesota and Minneapolis. En route from New Orleans to Los Angeles, they were lost 4 days in the Arizona deserts. On the Mexican border, their presence was evidently undesirable to the Mexicans, the majority of whom neither vote nor care to, and they were shot at. Meanwhile, they were distributing suffrage literature everywhere and putting in good words for their sisters. Altogether, they traveled 10,700 miles.

For All Saints' Eve When Witches Gambol

Nut and Apple Salad
Brown Bread Sandwiches Olives
Popped Corn
Cake
Cider Punch

Or, if you want a really, truly, bewitched Hallowe'en supper, why not try an outdoor fire and cook wieners, eggs, bacon and make hot coffee in strictly woodsy fashion? One celebrator made Welsh rarebit! in a skillet! with a fire from dead leaves! and cooked all the spirit of holiday into it so that no chafing-dish product ever surpassed it.

Women and the War

Europe, and all the world, for that matter, is greatly concerned over what will be done in regard to the women who have filled the places of men in the working world when peace shall have come. The United States worries, we are told, over the many women now working in the munitions works which have sprung up like mushrooms since war began. Other neutral nations have troubles of the same nature, especially those where the men have

been more or less mobilized for protection. The warring nations, of course, have found it imperative to supplant all able-bodied men with women.

England is especially concerned over the after-the-war problem. Before hostilities began her census showed 1,000,000 more women than men. Even then it was hard to keep the line drawn between man's and woman's work. Since her army has been recruiting, the women have stepped into the various lines of labor hitherto barred to them. No labor is too manual. They drive taxis and make guns and do everything one used to think they shouldn't.

The illustration on this page shows that British women have even invaded the field of the soldier, not as nurses, which would be correct and proper, according to old standards, but as drivers of ambulances. They are capable of caring for their own cars and make all but the most serious repairs. And they seem to enjoy it, too, if we can believe the camera's evidence. But John Bull is not so joyful over it, put up with it for the time being though he must, and even though the end of the war is not yet in sight, he is asking himself, "What am I going to do with them?"

Beauty Hints for the Woman Motorist

No. 10

A WOMAN'S hands make up a large part of the total number of assets she can offer. The stage recognizes this, and the woman with "the hands" is of great demand. To mention a recent addition to the star gallery is to mention Jane Cowl, even now not of universal acquaintance, but certain of her niche nevertheless. Miss Cowl's hands are mentioned almost as often as she is. Their appeal is personal, talented and far reaching in its influence on an audience.

All women would like to have hands of this character. Some are born with the long, slim hand which appears well in spite of the owner's neglect. Others have the short, stubby, flat nailed hand, which constant care cannot beautify. In either case any defect or injury to the hand is of both mental and physical discomfort. The women who motors knows this as well as anyone, especially if she goes on a tour and encounters the dust of the road for any length of time. The nails become brittle and break easily. The skin has that dry, harsh look and sometimes is red. The hands feel uncomfortable, and they look uncomfortable, not to speak of unbeautiful.

When going on a trip of any length, you should provide for the care of your hands, as well as face. One reason for the trouble awaiting the motorist is that the wind and dust between them dry out the skin even if gloves are worn constantly. It is the same principle that makes some women think dishwashing ruins their hands. The soap in that case dries all the natural oil from the hand, and the tissues suffer.

Cold cream is good, but olive oil is better. It should be applied not only to the skin of the hand but to the nails. You will notice the difference soon after the application. When the nails become more pliable it is a sure sign the general condition of your hands is better. Try this if you find your hands feel harsh after motoring. It is also good for chronic dryness of skin and brittle nails.

Do You Keep Hallowe'en

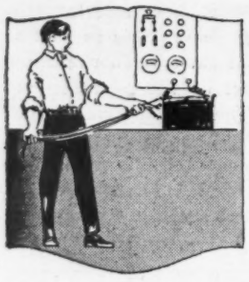
It is never too late to plan something unusual for Hallowe'en, and thinking perhaps other plans may help yours, one ideamaker passes this on to whomever it may benefit.

Hallowe'en to be ideal is on a crispy, frosty night. There is a chill in the air which might lead one to believe indoors was the place for that indivdual. But not so for the car owner, and particularly the truck owner. For this particular idea calls for a truck, though a car may be made to do.

Hay wagons of old leave pleasant memories, but their drawbacks of horses to look after, slow pace to put up with and increasing rarity also leave much to be desired. Anyway, they belong more to hot, summer days and Sunday-School picnics than to Hallowe'en, frost and that spooky feeling of something in the air.

Take a truck, bed it with hay or straw if you wish, then load it up well and go out to Three-Mile Creek, Rollins Springs, Sulphur Springs, or whatever your locality may offer. A big roaring fire — of brush, for that is best in keeping with the hour — marshmallows, long, spear-pointed switches, and the fun will begin. Bring in all the old-fashioned, giggley superstitions of apple peel and witches if you wish. Around the campfire the magic will be even more. Have supper, there is a suggestion given here, order a moon; then if you don't think all the ghosts and spirits of Hallowe'en are after you when you motor home through the woods, where the grinning old moon hides around the branches, the day of the prophet is over and what you want is bed instead of a jaunt with Halloween witches.

Not only are English women serving at home in the factories, on the streets and in the shops, but they are serving on the firing line. This shows four of them now with the hospital corps in France. They are not nurses, as one might expect them, as women, to be, but drive the ambulances. Some of them have already been under fire, for the hospital car is by no means a house plant



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the seventeenth installment of a weekly series of articles which began in Motor Age issue of June 29, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.

WHAT HAS GONE BEFORE

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems and the relations of current pressure and resistance brought out. This was followed by an explanation of series and multiple circuits, and how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells were taken up and the best methods of connecting them. A separate section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and best methods of charging them. Magnets and electro-magnetism then were considered and the principles of generators and motors explained.

Part XVII—Generator Output

As explained in the previous section, the electrical pressure generated in the armature winding of a generator depends upon the number of wires on the surface of the armature, the manner in which these wires are interconnected, which determine the number of different circuits through the armature winding; the number of magnetic lines, called the magnetic flux, entering or leaving the armature at the different poles; the number of magnetic poles forming the magnetic circuit; and the speed at which the armature is revolving in the magnetic field. After a generator is constructed, the number of magnetic poles, the number of wires on the surface of the armature and the number of different circuits through the armature are all fixed, while the speed and number of magnetic lines, or magnetic flux, per pole may either or both be changed.

The speed of the generator, of course, depends upon the speed of the device driving it and the manner in which the generator is connected to this device. The armature of the generator may be mounted on the shaft of the driving device or it may be geared or connected to the shaft by a clutch or chain. In some cases the construction of the driving clutch is such that the armature of the generator never exceeds a predetermined speed, regardless of the extent to which the speed of the driving device increases.

The magnetic flux per pole depends upon the form of the magnetic circuits, the kind of material composing the magnetic circuit remains constant, then the electrical pressure generated in the armature winding will vary directly as the speed of the armature, starting at nothing for no speed and increasing directly as the speed increases. The relation of the electrical pressure generated to the speed is shown graphically in Fig. 123, in which speed and the number of ampere-turns acting on each magnetic pole. The number of ampere-turns, magnetizing effect, of a coil is equal to the product of the number of turns in the coil and the current in these turns. After the machine is once constructed, the form of the magnetic circuit, the kind of material composing the magnetic circuit and the number of turns in the different windings about the fields are all fixed and constant in value. The only way then—neglecting armature reaction which will be explained later—that the magnetic flux entering or leaving the armature at the different poles may be changed is by varying the value of the current in the field windings.

Assuming for convenience that the magnetic flux per pole is measured along the horizontal and pressure along the vertical. If the magnetic flux per pole be changed, say decreased, then there will be a corresponding decrease in the pressure generated for the different speeds as indicated by the dotted curve.

If the speed of the machine be maintained constant and the magnetic flux per pole be increased, there will be an increase in the electrical pressure in the armature winding as shown graphically in Fig. 124, in which magnetic flux is measured along the horizontal and pressure along the vertical. If the speed of the machine be changed, say decreased, then there will be a corresponding decrease in the pressure generated for the different values of magnetic flux per pole as indicated by the dotted curve.

The magnetic flux per pole does not have a definite relation to the current in the field winding surrounding the pole, due to the fact that the permeability of the iron forming the magnetic circuit is not constant but depends upon the degree to which it is magnetized. You can think of the permeability of the iron as being its property to conduct magnetic flux as compared to the ability of air to conduct magnetic flux, which for convenience is assumed to have a permeability of one. The relation between the magnetic flux per pole and the current in the field winding is shown in Fig. 125. It will be seen from an inspection of this curve that the magnetic flux at first increases very rapidly, due to an increase in the value of the field current, but after the flux has

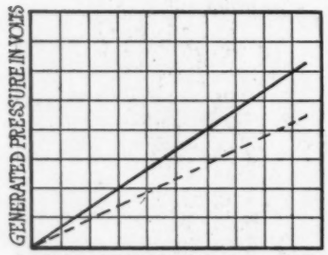


Fig. 123—Relation between armature speed of a generator and the pressure it generates. The dotted line shows how the pressure drops when the speed decreases and why the lights dim slightly when engine slows

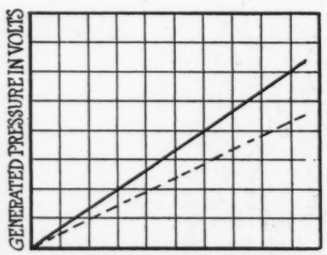


Fig. 124—Relation between the magnetic flux in a generator and its generated pressure, at constant speed. The dotted line shows how the pressure drops when the field strength decreases

reached a value represented by the point A in the curve the increase due to an increase in field current is decidedly less. When the magnetic flux has reached the value represented by the point A, the magnetic circuit is said to be *saturated* and above this point there is very little increase in flux even though there be a large increase in the field current.

Operation of Self-Excited Shunt Generator

The connections of the self-excited shunt generator that is, one supplying its own field current, have been given. When the armature starts to rotate there is one electrical pressure generated in its winding, due to the residual magnetic flux in the magnetic circuit, which produces a current in the field winding and this current increases the magnetic flux per pole. As a result of both the speed and magnetic flux increasing, the generated pressure increases more rapidly than if the speed alone were to increase. After the magnetic flux has reached a certain value, however, the magnetic circuit becomes saturated and then there is very little increase in the magnetic flux per pole even though the field current continues to increase.

After the magnetic circuit has become saturated, the increase in generated pressure is due almost entirely to the increase in speed. The relation between generated pressure and speed is shown in a general way in Fig. 126. Up to the point A on the curve there is a very rapid increase in generated pressure as the speed increases, since the magnetic flux per pole and the speed are both increasing. From the point A, however, the generated pressure increases less rapidly, as the magnetic circuit is practically saturated and the speed above is increasing.

Constant Current and Constant Voltage Output

The output of a generator in watts is equal to the product of the current the generator is delivering in amperes and the pressure at which this current is delivered in volts. The current delivered by a generator to a circuit containing no other source of electrical pressure is equal to the generated pressure in the armature of the generator divided by the total resistance of the circuit, including the connecting leads and the resistance of the armature of the generator itself. If the pressure generated in the armature winding of the generator remains constant, the current supplied by the generator will vary inversely as the resistance of the circuit in which the generator is connected. That is, if the resistance of the circuit increases, the current in the circuit will decrease and if the resistance of the circuit decreases, the current will increase.

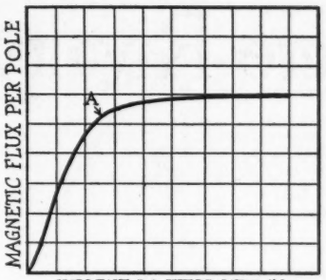


Fig. 125—How the magnetization of a generator field pole increases with the increase in current in its field winding. The point A indicates the saturation point

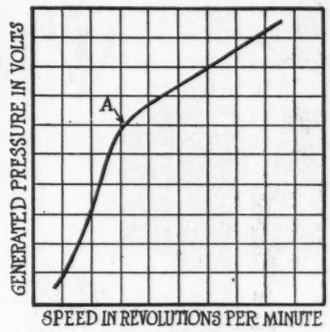


Fig. 126—Relation between the generated pressure and armature speed of a shunt generator. Above a certain point A the pressure increases more slowly with increase in speed

If the pressure generated in the armature winding of the generator changes in value, the resistance of the circuit remaining constant, there will be a corresponding change in the value of the current. That is, if the pressure increases, the current will increase and if the pressure decreases, the current will decrease. If, however, the pressure generated in the armature of the generator and the resistance of the circuit both changes, then the current at any time is equal to the pressure at that time divided by the value of the resistance at that time.

When the output of a generator is at a practically constant current, the pressure varying in value or not as the case may be, the generator is spoken of as a *constant current* generator. When the output is at a practically constant pressure, the current varying in value or not as the case may be, the generator is spoken of as a *constant pressure* generator.

NEXT WEEK

The next installment of the series on Electrical Equipment of the Motor Car will explain the purpose and operation of cutouts

Resta Wins Again on Chicago Speedway

(Concluded from Page 21)

front of the J.-M. extinguisher pit and these overworked firefighters made quick work of it.

Ralph de Palma went out with a broken valve. It is getting to be a conventional statement that Ralph goes out with some part of his motor broken and many race fans have ventured to ask "Where is the de Palma of a year ago?" The veteran driver once carried the reputation of humoring his car in the early part of a race and leaving his spurt for the last. His tactics throughout the 1916 season have been just the reverse, and there does not seem to be a car built that will stand his Bob Burman-like driving. This Peugeot has been a particular offender in valve trouble, Mulford having run up against the same thing when he drove the car.

Again Buzane's Duesenberg sprung a leak in the water pump. This car has this particular trouble as regularly as the starting flag is waved. In today's race it was even worse than ever and the water which spurted from the leaky pump packing found its way into the carbureter and caused four pit stops.

Wilcox, another of the Peugeotic contenders, experienced a typical de Palma last-hour demise when he rolled into the pits with one lap to go, with a broken rod. He was then running in fourth place which made the faulty connecting rod an expensive investment.

Ira Vail, who drove his battery-ignited, starter-equipped Hudson to such an important position in the Sheepshead Bay race, drove the last 150 miles on five cylinders, and finished in tenth position. He broke a bushing in the valve-lifter assembly and after 20 minutes of frantic effort, he and his mechanic removed the lifter guide and re-entered the race with the one valve inoperative. Because of the quiet exhaust of the Hudson few people in the stands knew of the trouble and wondered what had become of the mooted Hudson speed.

Spark plugs again had a hand in swelling the number of pit stops. There were nine stops for plug changes.

D'Alene's Crawford was equipped on its rear wheels with a brand new Goodrich cord tire, known as the Featherweight, which has a rubber tread only ½-inch thick. The new tire is designed purely for board track work and it is regrettable that D'Alene could have not gone further in the race so that its ability might have been proved.

PENNSYLVANIA SECTION MEETING

Philadelphia, Pa., Oct. 16—The first meeting of the Pennsylvania section for the season of 1916-17 will be held at the Engineer's Club on Thursday evening, October 26. The paper of the evening will be presented by Herbert Chase, chief engineer of the electrical testing laboratories, Automobile Club of America, and treasurer of the Society of Automobile Engineers. Mr. Chase will speak on the subject of "The Otto Cycle Versus Constant Pressure Cycle for Automobile Engines." He has given the subject much study.

Where Rivalry Builds Roads

The short route south of Meridian, Miss., to Vossburg, typical of the way Mississippi is building roads. The new construction is wide, well-graded, fairly straight and either already surfaced or about to be. Sand clay is used. It bonds easily and wears well

Jackson Highway Inspectors Find Year of Competition Has Brought Achievement

By William K. Gibbs

NEW ORLEANS, La., Oct. 7—Not in many years, if ever, has there been such a unity of purpose in road-building as that which the residents of southern Tennessee, northern Alabama, Mississippi and Louisiana exhibited to the pathfinding-inspection party that reached here this morning after a tour from Nashville, Tenn., to the Crescent city. To the men that make up the official inspection party is due much of the cerdit for instilling the germ of desire of better roads in the localities just passed through, for they made a similar trip a year ago to ascertain which route, that through Mississippi or that through Alabama, offered the best roads for reaching New Orleans from the north. These gentlemen were unanimous in the opinion that putting both Alabama and Mississippi on a competitive basis and giving each a year in which to put their house in order, figuratively speaking, before finally passing upon which route should be officially known as the Jackson highway, offered a greater incentive towards achieving good roads in both states than any other one plan.

After a meeting at Nashville last fall delegates from both states went back home and opened a campaign for road improvement. Just to the day that was promised the Jackson Highway Association started the original pathfinding party, retracing the ways it followed a year ago. This party is made up of W. L. Brown, Frankfort, Ind.; Walter H. Crim, Salem, Ind.; Emory G. Dent, Bowling Green, Ky.; R. E. Toms, government engineer, Washington, D. C.; Charles Priest, Chicago, driver of the Pathfinder twelve in which the party is making the trip; and the writer.

The grave of Catherine Sevier, wife of Tennessee's first governor, is located at the side of the highway near Russellville, Ala., and dates back to 1836

This week has been a revelation to the party. Even their fondest dreams never brought them any conception of what the result of their decision to put competition in roadbuilding would be. To the best of the writer's knowledge there never has been such continuity in constructive road-building in the history of any state. Do not confuse the term with any ordinary road construction. They build roads down in the Piney Woods of the South like they do railroad grades. Everywhere is evidence of straightening, widening, cutting and filling. A 40-foot grade is not uncommon and drainage, crown and material have been given close engineering study. It is just a little unfortunate that Nature has been stingy with rain in the South for the last 2 months; otherwise these new roads would have shown to better advantage. Work is being pushed in every county, even though the dry weather makes the bonding of road material next to impossible. Many of the counties in Mississippi construct roads of sand-clay, a practice that would never do in the northern states where frosts and wet weather combined would

play havoc with them, but a material that wears well, keeps hard and with dragging after rains amounts almost to a pavement in the South.

Every county that the party passed through from Nashville south has either completed its road, is working at present, or has bonds or money voted and on hand, with which to construct their part of the proposed route of the Jackson highway south of Nashville. The character of men who have the work of putting these roads in good condition, so that tourists from the North will have access to New Orleans and the South, leads one to believe that 1 year hence the Jackson highway from Chicago on the north to New Orleans on the south will be a completed road, which, if true, will be the first long cross-country route in this country that can truthfully be termed a completed road.

Now for what the party has seen and what the tourist will want to see as he slips away from the northern winter and heads toward the sunny South.

Pathfinder Twelve Carries Party

The pathfinding car is a Pathfinder in all the name implies. W. L. Brown, Frankfort, Ind., who owns the car, left his home, 45 miles north of Indianapolis, last Saturday morning, picking up a part of the party at Louisville, Ky., and the balance at Nashville, Tenn. The drive from Louisville to Nashville, a distance of more than 200 miles through the most hilly part of

One of Jackson's soldiers lies just off the road at Big Bear creek. He was buried in 1819

the route to New Orleans, was made in high gear, the drive being made Sunday. We left Nashville Monday morning, October 2, driving south through Davidson, Williamson, Maury and Lawrence counties. The day's drive included Florence, Ala., and throughout the day the rolling landscape was a constant reminder that Nature is the "workingest force known," to revert to a superlative common in the South. Maury county, Tenn., of which Columbia is the county seat, is affectionately known to Tennesseeans as "the dimple of the universe." The term is apropos since the hand of Nature seems to have paused for a new grip at this point and having gained it, tarried a while to see just what the Master mind could do.

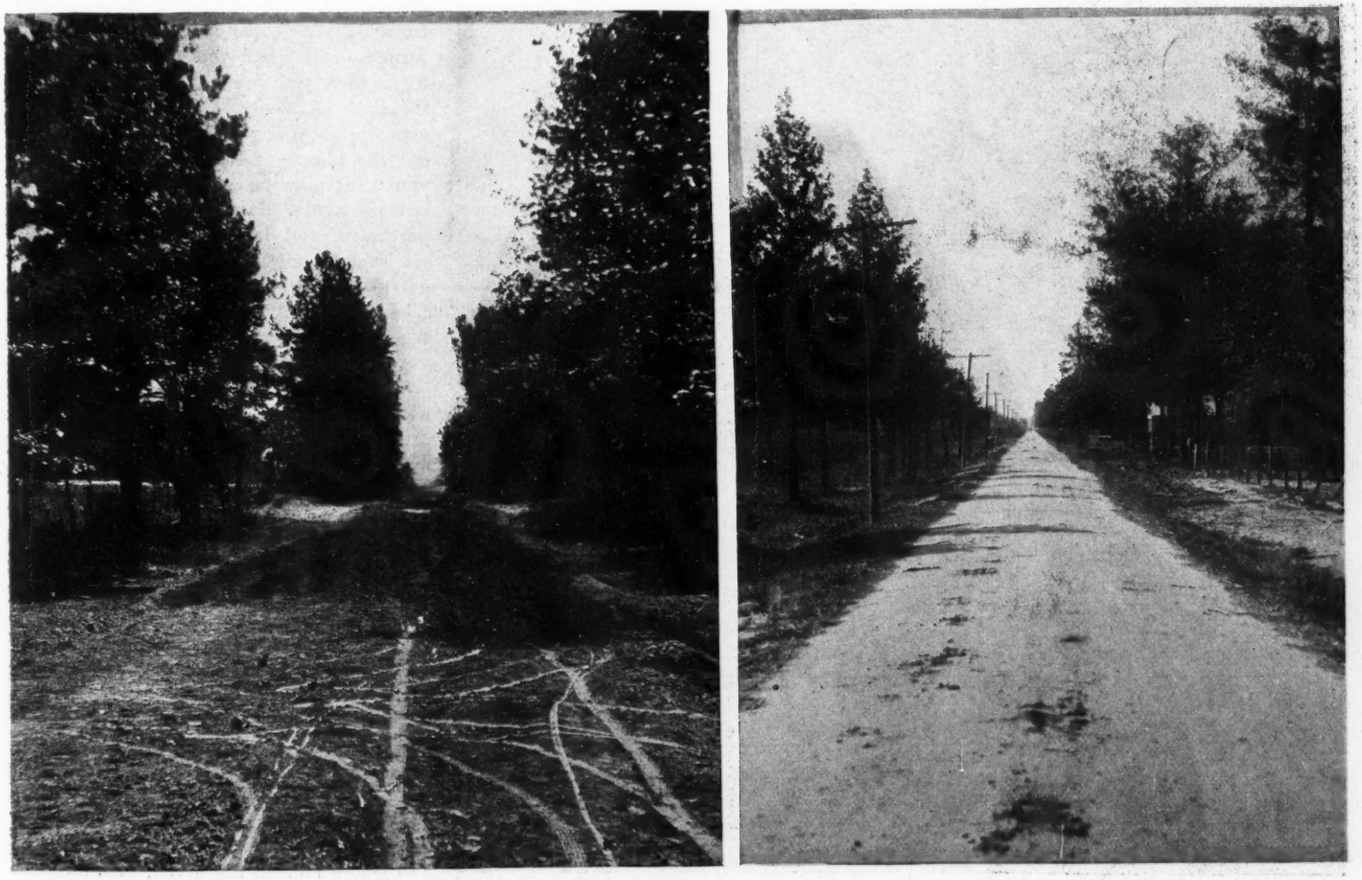
A stop was made at Rockdale, Tenn., to inspect the big ferro-phosphorus plant owned by J. J. Gray. Mr. Gray has a secret formula for making ferro-phosphorus, a material that comes from the phosphate rock and iron found there and which is used in giving steel resiliency. Mr. Gray is an official of the Jackson Highway Association.

Between Franklin and Columbia, Tenn., there are three toll gates, where the charge is from 25 to 40 cents. Lawrence county, Tenn., roads are not good at present, but passable. A bond issue has been passed and work is under way; the route through this county is contracted to be completed next summer. The completed road, which will measure 37 miles in this county, is to cost $3,700 a mile.

Water Power Development

At Florence, Ala., where the party spent the night, is the famous Muscle Shoals project, where it is proposed to locate a government plant for making nitrate. The water power possible here is far in excess of any other development now in use. It will be possible to develop 680,000 horsepower.

Crossing over from Florence, Ala., to Sheffield, where the party took breakfast Tuesday morning, there is a toll bridge—



Note the wide grade and the character of country through which the Mississippi route passes. Novaculite road with asphaltic treatment leads out from Meridian, Miss.

charge 5 cents a passenger—over the Tennessee river. Three cities nearly join each other at this point—Florence, Sheffield and Tuscumbia. The house where Helen Keller was born is in Tuscumbia, where the party made a short stop. We were directed down through Alabama toward the Mississippi line by Simpson Keller, a brother of Helen Keller, who is state highway commissioner.

Strong for Jackson Trail

Residents of eastern Mississippi and northwestern Alabama have an inborn desire to follow the steps of Jackson when he brought his army back to Nashville after victory at New Orleans. The route the pathfinders traveled this week purports to be virtually the same as that over which Old Hickory cut his way, back in 1819. Evidences of Jackson's route are found just south of Russellville, a grave marker being still in existence just off the road on Big Bear creek. Russellville greeted the party and showed its constructed as well as proposed road. There is much iron in this district, and one of the largest mills for washing brown ore is at Russellville.

The Master painter has splotched the forests with brown and gold and October seems ideal for touring in the South. Spinning along at a 40-mile pace over Marion county's roads, through Hackleburg and Hamilton to Guin, where we had lunch, was a real pleasure. Unfolding before us were fields of cotton, though it must be confessed that the boll weevil made the cotton crop poor this year as it has for the last 4 or 5 years, but the stalks were there and we saw considerable cotton being picked and carried to town. Down here they never haul anything — they carry it.

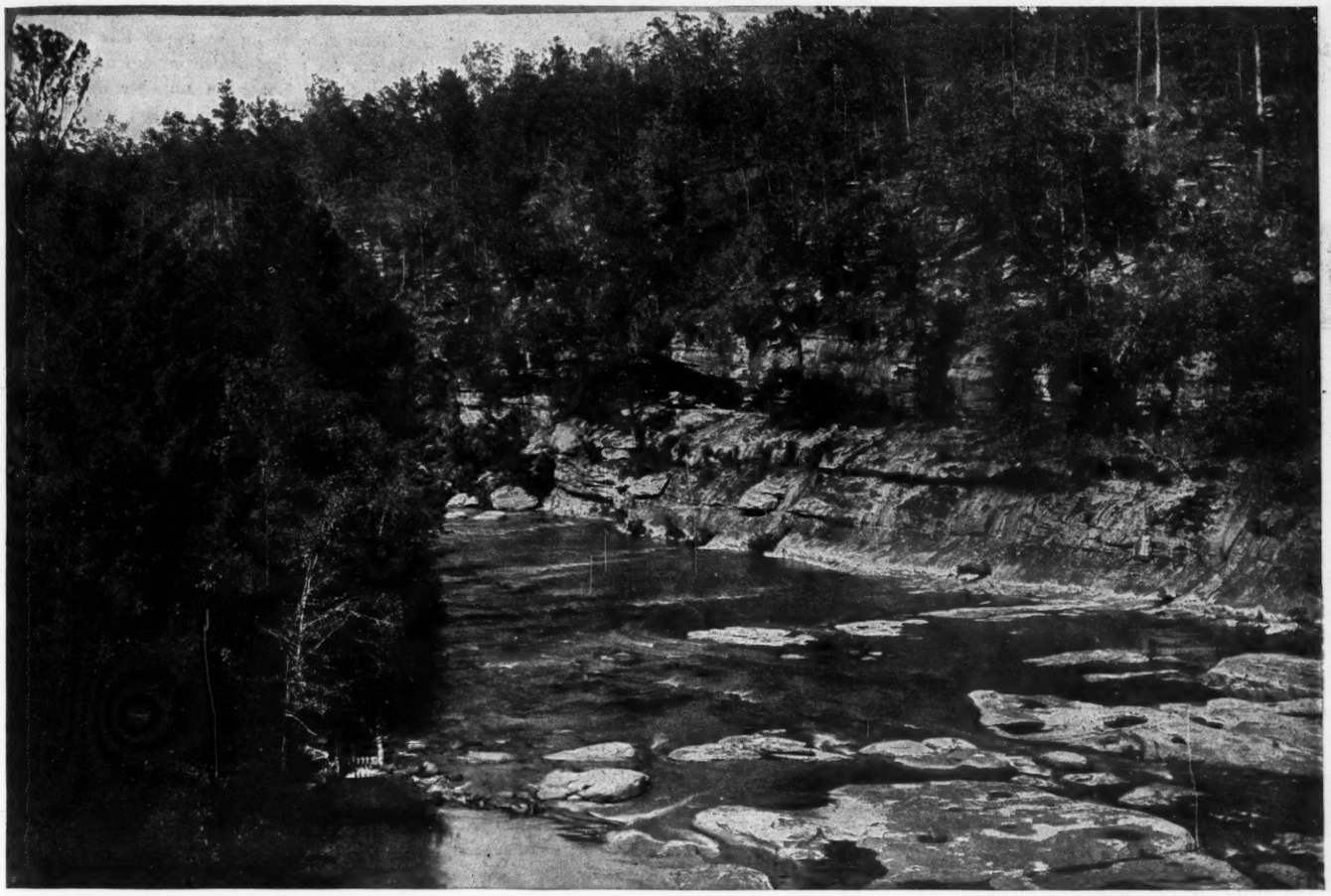
Typical Laurel, Miss., home. About 75 per cent of the citizens own their homes. Every building is of modern construction

New stretch of road parallel to the New Orleans and North Eastern railway. The grade is built like the railroad grade

There is one unique thing in Guin, at least it was to me. The dining-room table in the hotel would never do for the inebriate. Getting your food is about like the way the drunken man got home. He sat on the curb and watched the houses rush past until his came along and he grabbed it. The revolving elevated platform on which the food is put must be turned until what you want comes your way; then you grab it. I use the term "grab" advisedly, for someone on the opposite side may be turning the table—get the idea?—and the particular eatable you want may be gone before the circuit is made again. It surely is a table of opportunity, and it pays to be alert when six such hungry individuals as we were get to playing with that wheel of fortune. I looked steadily for several revolutions to see if there might be any butter, but could not locate any. I inquired if it had been left off by mistake, but was told they did not have any, in fact, did not use it. There are very few cows in that vicinity. However, the chicken, sweet potatoes, fried pie—no you don't get it north of the Mason and Dixon line—were fine and we got along very nicely without the butter.

First Night in Mississippi

The night brought us through Vernon and over the line into Mississippi. A delegation from Columbus met us at the state line and piloted us in. Wednesday morning a visit was made to the Industrial Institute and College, a state institution for the education of girls in the arts and sciences. This school has more than 1,000 girls enrolled, and the total cost a year to each girl is $110. Any subject they wish to take up is given. There is a large music hall where recitals are given, such notables as Paderewski, Sembrich, Schumann-Heink and others being brought there each year.



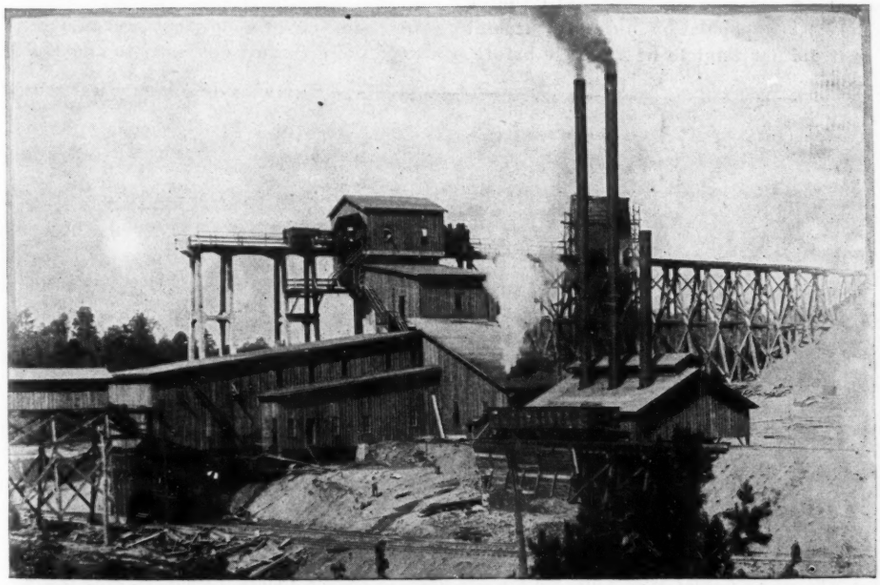
The Buttahatchie river near Russellville, Ala., has all the charm that rock and trees and vines can give it

The girls designed one of the buildings. It is laid out so that the least number of steps are taken in performing any work. Girls take turns in doing the work of different sorts, from the most lowly up to that of hostess.

Leaving Columbus, the next objective was Meridian, Miss. In this run of approximately 100 miles the roads were all good with the exception of those in Kemper county, that is, below Macon. However, this county has its bonds issued, and the contracts for the road will be let next week.

After passing out of Kemper county into Lauderdale, roads were ideal. The road into Meridian, through Lauderdale county, is of novaculite, a kind of material that comes from Illinois, with an asphaltic treatment. It is practically dustless and as hard as any asphalt pavement.

Meridian is the largest city in Mississippi, having more than 30,000 population. It is in the heart of a prosperous agricultural and stock-raising section. Here the landscape is rolling but not broken. For a town of its size Meridian has a larger number of railroads than most cities. At present there are six railroads in operation and another building. In a word, this city is well kept, up-to-date and anyone's time there is well spent.



The largest single washing plant for brown ore in the country is this one, located at Russellville, Ala.

Mississippi's Road Champions

Along with J. M. McBeath, Mississippi highway commissioner, another who has the well wishes of Meridian and Mississippi at heart is Cliff Williams, who has had an important part in the upbuilding of the city. Mr. Williams is known as Mississippi's greatest booster and he well deserves the name. In order that the path-finding party might understand just how much he wishes the Jackson highway to come to Meridian, Mr. Williams took his family and came all the way into New Orleans with us, acting as a stimulant to everyone we passed, and he seemed to know them all. Another man who has done considerable for the roads of Clark county, Miss., is T. J. Bolster, Quitman, Miss., manager of the Mississippi Lumber Co. at Quitman. He, too, accompanied us to New Orleans. The women refused to

Five Oaks, near Russellville. Here Jackson's army camped on its return from victory at New Orleans

be left behind so from a party of six mere men that reached Meridian the delegation was augmented by Mr. and Mrs. Williams; Mrs. Hemming and Mrs. Perrine, daughters of Mr. and Mrs. Williams; Mr. Perrine, and Mr. and Mrs. Bolster.

Driving 40 miles to breakfast surely develops an appetite, and there was an invitation from Mr. and Mrs. Bolster to breakfast with them at Quitman Thursday morning. It was a breakfast worthy of driving many miles to get and the Bolster home is ideal. The house is new, the old one having burned this spring and the pathfinders amounted almost to a housewarming party. The Mississippi Lumber Co.'s mill at Quitman is one of the largest in the South.

A Cutoff Found

Two routes were offered the pathfinders out of Meridian to Vossburg and Stafford Springs, one 25 miles shorter than the other, so both were inspected. However, it is not the purpose of the pathfinding party to designate every foot of the road, but rather to give the major cities through which it will pass and let the local people settle for themselves which way to route the traveling public.

Laurel, Miss., entertained us at lunch Thursday. This is a city of 15,000, and it is only 15 years old. Here is an exemplification of a new town. Every building is new and of modern construction. There are two big sawmill interests here, the Eastman-Gardiner and the Gilchrist-Fordney companies. There is nothing of the boom town about Laurel. It shows good substantial growth.

Out of Laurel on the way to Hattiesburg, where we spent Thursday night, we passed through Ellisville and Mozelle, over good roads practically all of the way.

The roads south from Hattiesburg took us through Pruvis. Here the school children, several hundred strong, cheered with their college or school yell and sang. The next stop was at Lumberton, and the party divided at Popularville, one going to Picayune and thence to Slidell to inspect the proposed road that way, while the others drove directly west into Louisiana from Popularville. We ferried the Pearl river and were in Louisiana, a run of a few minutes bringing us to Bogalusa, a town of some 12,000. Although only 10 years old, Bogalusa boasts of having the largest sawmill in the South, that of the Great Southern Lumber Co.

The story connected with Bogalusa is interesting. The first building in the city was the Pine Tree Inn, which would be a credit to any city. The material of which the hotel was made was cut on the spot where it stands and the lumber used in all the buildings of the city was cut off the townsite. Ten years ago this spot was a dense pine forest. The name comes from the Choctaw Indian words, "Bogue Lusa," meaning black creek. Not until the city had 10,000 population did it incorporate, as it did not want to be a village before it was a city, yet Uncle Sam gave it letter carriers, something he never has done before for an unincorporated town.

The Great Southern Lumber Co. cuts a million feet of lumber daily, and to get the logs 50 acres of timber are cut daily. The company has its club houses, Y. M. C. A., hospital and, in fact, is a very up-to-date city.

Quaint Old Village

From Bogalusa the party drove to Covington and thence to Mandeville, a quaint old village on the shores of Lake Pontchartrain. The object of driving to this town is that it is the only way to get into New Orleans with a car, except by going around by Baton Rouge to the west. From Mandeville the ferry runs over to New Orleans in the morning and back at night. Hotel accommodations are not so good at Mandeville as they are at Covington, which is about 10 miles from Mandeville. Here is a great health resort and good hotel accommodations. Mandeville is a rather quaint old place with the early French style of architecture predominating.

We slept in rooms that had French windows, which we left open and drew a curtain across for privacy. The curtains, however, came neither to the top nor bottom of the windows, but were more like those double swinging doors we sometimes see in the front and at the side of certain establishments. I could lie in bed and look out over Lake Pontchartrain, and during the night I got to dreaming of alligators, having seen several during the day. We had to get up before daylight to catch the ferry and I rather gingerly put my feet on the floor for fear some of the crocodiles might have come to pay me a visit during the night. Of course, I am not well versed in the habits of these reptiles, but if there are any in the lake they could have come in as well as not for the room was almost on a level with the ground. Someone told me I slept in the same room that was once occupied by Lafayette or some other French notable.

If there is any doubt as to the ability

This is typical of the streets in Laurel, Miss., a city of 15,000, though only 15 years old. It is not a boom town but a progressive city built to last. It is a new town, both in years and appearance

of reaching New Orleans without going by Baton Rouge, let the tourist disperse such thoughts from his mind. It not only is feasible, but the trip around by Bogalusa and Covington is one of the prettiest of any we have covered. Driving for miles through immense stands of virgin pine without any undergrowth makes one think of a well-kept park.

The rate on the ferry is $5 a car and 50 cents for each passenger in summer and 75 cents in winter. The ferry is a substantial steamer and can accommodate several cars. There is another larger boat that will be used if traffic is heavier than it has been. This will accommodate twenty cars. The approach at Mandeville is easy, being amply wide and safe. However, the dock on the opposite side of the lake, some 22 miles distant, is a little narrow, but it can be made if caution is used. More than a thousand cars were carried this summer, and there never has been an accident. Officials promise to give better facilities on the New Orleans side soon so that the ferrying will be made even more simple.

A project of building a road to the southwest of the city is under way, and it is planned to connect it eventually with Logtown, Miss., by filling and bridging, similar to the manner in which the Louisville and Nashville railroad crosses the Rigolets. This work is under way and probably will be completed by next year, giving entrance to New Orleans from the east as well as from the west over good roads the entire distance across marshes.

The party will stay here until Monday night and then will go to Mobile and up through Alabama to inspect the route that way, after which the official route from Nashville south will be designated.

I almost forgot to mention that we arrived in New Orleans on Indianapolis air and without any repairs to the car of any kind being necessary.

Routes and Touring Information

Chicago—Jacksonville, Fla.

CHICAGO—Editor Motor Age—Kindly give the best route from Chicago to Jacksonville. Fla.—J. F. McChesney.

In going from Chicago to Jacksonville, Fla., the best route is to go south through Thayer, Remington, Wolcott, La Fayette, Frankfort, Indianapolis, Columbus, Seymour, Salem, Louisville, West Point, Elizabethtown, Cave City, Glasgow, Springfield, Nashville, Murfreesboro, Manchester, Tracy City, Chattanooga, Rossville, Dalton, Cartersville, Atlanta, Griffin, Barnesville, Macon, Perry, Hawkinsville, Waycross, Callahan, to Jacksonville.

Volumes 4 and 6 of the Automobile Blue Book will give you a complete routing for this trip.

La Fayette, Ind.—St. Petersburg, Fla.

Boswell, Ind.—Editor Motor Age—Kindly give the best route from La Fayette, Ind., to St. Petersburg, Fla.—F. K. Samuel.

In going from La Fayette to St. Petersburg, the best routing for you to follow is to go south through Frankfort, Indianapolis, Columbus, Seymour, Salem, Louisville, West Point, Elizabethtown, Cave City, Glasgow, Springfield, Nashville, Murfreesboro, Manchester, Tracy City, Chattanooga, Rossville, Dalton, Cartersville, Atlanta, Griffin, Barnesville, Macon, Marshallville, Montezuma, Leesburg, Thomasville, Greenville, Madison, Live Oak, Houston, Lake City, Mason, High Springs, Gainesville, Ocala, Stanton, Eva, Lakeland, Tampa, then to St. Petersburg.

Beatrice, Neb.—Florida

Beatrice, Neb.—Editor Motor Age—Kindly advise me regarding the condition of the Dixie Highway, and how late in the fall it would be feasible to leave Chicago.—G. Wheaton.

In going to Florida we advise that you go via Marysville, Seneca, Hiawatha, Highland, Troy, St. Joseph, Cameron, Chillicothe, Brookfield, Macon, Hannibal, Springfield, Decatur, Newman, Rockville, Indianapolis, then south through Columbus, Seymour, Salem, Louisville, Mammoth Cave, Nashville, then through Murfreesboro, Manchester, Tracy City, Chattanooga, Rossville, Dalton, Cartersville, Atlanta, Griffin, Barnesville, Macon, Perry, Hawkinsville, Waycross, Callahan, to Jacksonville, Fla.

If you wish to come up to Chicago, the best way would be via Lincoln, Omaha, then follow the river to river road through Des Moines and Davenport, then through Sterling into Chicago, or go via Princeton, La Salle, Ottawa, then up to Chicago.

The Dixie Highway from Chicago south is not advised to Indianapolis. You will find it better to go via Thayer, Renssalaer, Wolcott, La Fayette, then through Frankfort and Lebanon, to Indianapolis, picking up the Dixie Highway at Indianapolis.

Volumes 4, 5 and 6 of the Automobile Blue Book will give you the complete running directions for this trip.

Macomb, Ill.—Winner, S. D.

Macomb, Ill.—Editor Motor Age—Kindly give the best route from Macomb, Ill., to Winner, S. D., also the distance.—Glenn Crawford.

In going to Winner, S. D., we advise going via La Harpe, Ft. Madison, Fairfield, Ottumwa, Oskaloosa, Prairie City, Des Moines, Adair, Atlantic, Omaha, Fremont, Columbus, then north via Norfolk, Pierce, then northwest through Plainview, Lynch, Fairfax, Burke, Dallas, to Winner, S. D.

Volume 5 of the Automobile Blue Book will give you complete running directions for this trip.

Kingsley, Kans.—Hot Spring, Ark.

Greensburg, Kans.—Editor Motor Age—Kindly give the best route to Hot Springs, Ark., from Kingsley, Kans. Will there be streams to ford? Is there any part of the road that is rocky and hard on tires?—C. Thomas.

From Kingsley drive via Hutchinson to Newton, then south to Wichita. From Wichita go via Winfield, Independence and Galena, then south to Muskogee, and east through Ft. Smith, to Hot Springs, Ark.

You will probably have a number of streams to ford.

The roads will be rocky, particularly in Arkansas.

Elburn, Ill.—St. Petersburg, Fla.,

Elburn, Ill.—Editor Motor Age—Kindly advise the best route from Elburn, Ill., to St. Petersburg, Fla.—S. R. Knox.

In going to St. Petersburg, Fla., we advise you to come into Chicago, then go south via Thayer, Renssalaer to La Fayette.

In going from La Fayette to St. Petersburg, the best routing for you to follow is to go south through Frankfort, Indianapolis, Columbus, Seymour, Salem, Louisville, West Point, Elizabethtown, Cave City, Glasgow, Springfield, Nashville, Murfreesboro, Manchester, Tracy City, Chattanooga, Rossville, Dalton, Cartersville, Atlanta, Griffin, Barnesville, Macon, Marshallville, Montezuma, Leesburg, Thomasville, Greenville, Madison, Live Oak, Houston, Lake City, Mason, High Springs, Gainesville, Ocala, Stanton, Eva, Lakeland, Tampa, then to St. Petersburg.

Volumes 4 and 6 of the Automobile Blue Book will give you a complete routing for this trip.

Stuttgart, Ark.—Siloam Springs, Ark.

Ulm, Ark.—Editor Motor Age—Kindly give the best route from Stuttgart, Ark., to Siloam Springs, Ark., either via Conway, Ark.; or Hot Springs and Mena.—Dr. O. C. Struthers.

In going to Siloam Springs, go via Little Rock, Russellville, Clarksville, Van Buren, then north through Chester to Fayetteville, where you can make local inquiry as to a routing into Siloam Springs.

Fairmount, Ill.—Nashville, Tenn.

Fairmount, Ill.—Editor Motor Age—I wish to make a trip to Nashville, Tenn. Would it be practical to go via Terre Haute, Evansville, and straight south to Nashville, or would it be better to go via Indianapolis and Louisville?

Where can I procure an Automobile Blue Book covering this route?—A. H. Gunder.

You can go via Terre Haute and Evansville and down to Hopkinsville, then to Nashville, if you wish, and will get slightly better roads than by going via Danville, Indianapolis, Seymour, Salem, Louisville, Mammoth Cave, and then down. However, this makes a good option.

Volume 4 of the Automobile Blue Book will give you directions over both routes. You can procure this of the Automobile Blue Book Publishing Co., Mallers Bldg., Chicago. Price $2.50.

Newton, Ill.—Staunton, Va.

Newton, Ill.—Editor Motor Age—Kindly give the best route from Newton, Ill., to Staunton, Va.

Where can I procure a good road guide for this trip?—H. O. Smith.

Leaving Newton, Ill., we advise going via Robinson, Palestine, Sullivan, Terre Haute, Rockville, Danville, to Indianapolis.

From Indianapolis, go via Greenfield, Cambridge City, Germantown, Richmond, Eaton, to Dayton, O., then via Harshman, and Springfield, to Columbus, O., and via Granville, Newark, Zanesville, and Bridgeport, to Wheeling, W. Va.

In going from Wheeling, W. Va., to Uniontown, Pa., we advise going via Washington, Brownsville, to Uniontown. Then via Farmington, Addison, Cumberland, Hancock, and Clear Spring, to Hagerstown, and via Martinsburg, Winchester, Woodstock, Harrisonburg, to Staunton, Va.

Volumes 4 and 3 of the Automobile Blue Book will give you running directions.

Bicknell, Ind.—St. Petersburg, Fla.

Bicknell, Ind.—Editor Motor Age—Kindly publish a route from Bicknell, Ind., to St. Petersburg, Fla.—G. Cleveland.

In going to St. Petersburg, Fla., we advise that you go via Washington, Shoals, Mitchell, then down to Paoli and via Hardinsburg, Greenville, New Albany, to Louisville, Ky. Then go via West Point, Elizabethtown, Cave City, Glasgow, Springfield, Nashville, Murfreesboro, Manchester, Tracy City, Chattanooga, Rossville, Dalton, Cartersville, Atlanta, Griffin, Barnesville, Macon, Marshallville, Montezuma, Leesburg, Thomasville, Greenville, Madison, Live Oak, Houston, Lake City, High Springs, Gainesville, Holder, Floral City, Brooksville, Tarpon Springs, Clearwater, to St. Petersburg.

Volumes 4 and 6 of the Automobile Blue Book will give you complete running directions from Washington, Ind.

The Readers' Clearing House

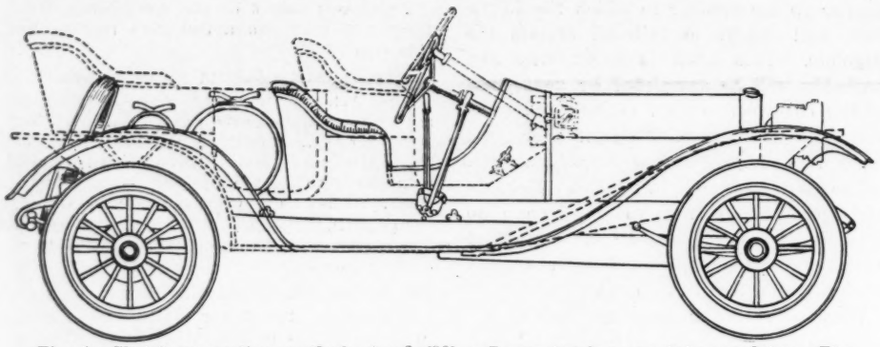


Fig. 1—Sketch suggesting method of rebuilding Parry touring car into speedster. The same front seat is utilized

SPEEDSTER BODY ON PARRY CAR

Proposition of Reconstructing Old Model Would Be Quite Inexpensive

NEW HAMPTON, Ia.—Editor Motor Age—How can one make a speedster body out of a Parry touring car The car itself is in first-class condition and is very fast while it is high geared. I want to make the car look like a racer and wish assistance from Motor Age. I wish to use sheet metal. What size of metal would Motor Age advise using? I would like to build the body from the Stutz speedster and want to paint the body white and wheels red. Is this all right? —Gus Ruckardt.

A conception of how your car should look if converted into a speedster is shown in Fig. 1. You will not think that this is very much along the lines of the Stutz. We do not think you would be obliged to go to a great expense to transform your car. The present front seat could undoubtedly be used as shown in the sketch. You would be obliged to lower the steering wheel, put gasoline and oil tanks on the rear with either a pressure or vacuum feed fuel system, and the job would be greatly improved in looks by adding fenders such as the one drawn into the illustration. We see no reason why the whole job could not be done within $100 or $150. The metal you use could be 18 or 24 gauge. The latter would probably be heavy enough.

BEST METHOD OF SHIFTING GEARS

Reader Is Referred to Previous Issue of Motor Age Giving Discussion

Milton, N. D.—Editor Motor Age—In a recent issue of the Scientific American, someone commented on gear shifting and said that the largest per cent of car owners did not know how to shift gears properly, but they did not discuss the subject. Will Motor Age go into this in detail and describe the method so that the average car owner can understand how to shift properly.

2—Now that the Ford races are over and different designs were tested out would you show how to build the best and fastest Ford roadster?

3—How can a Ford be equipped with cantilever springs? Where can the springs and fittings be procured?

4—Where can valves one-eighth inch larger than regular Ford valves be obtained?—A Reader.

1—The proper method of shifting gears was discussed in the Motor Age of August 31, page 39.

2—Inasmuch as several of the fastest cars seemed to have obtained their speed through a number of different means it is quite impossible to settle upon one rebuilding proposition which would prove the best. Have you read the story on page 20 of the September 14 issue of Motor Age? This sums up the various means employed in obtaining speed.

3—Motor Age has no record of a producer making cantilever springs for Fords. It would undoubtedly be a special job. Special brackets might be made up to fit to the present rear axle spring hangers and the other end of the cantilevers would, of course, have to be anchored to the frame.

4—You might try the following: Ford-Clark Co., 3125 Perkins avenue, Cleveland; Michigan Engine Valve Co., 115 Columbia street, Detroit, or Nelson Mfg. Co., 564 W. Randolph street, Chicago.

MOTOR ALWAYS OVER LUBRICATED

Reader Thinks Pistons Are Too Small—Favors Aluminum

Friars Point, Mass.—Editor Motor Age—I have a Saxon six and the motor has always over oiled, no matter what thickness of oil is used, yet it seems to have good compression on all cylinders. Is this not an indication that the pistons are a little small? But they are not small enough to cause a slap or knock that one expects in a loose piston.

2—What percentage of advantage in pick-up, speed, etc., would I get by putting aluminum pistons in this motor? It works fine in every way except this oil trouble which, of course, causes me to take carbon out every 1,000 or 1,500 miles. But if I have to change to larger pistons I thought I would go to the expense of installing a very light piston. What is the price of a set of six aluminum pistons?—Calvin H. Johnston.

There are a great number of things which could cause this trouble. If the rings were too loose the motor could become overoiled. The pistons might be small but we doubt it. The only way you can find out is to tear the motor down and micrometer the pistons and the cylinders. If a difference of 15/1000-inch exists the piston is too small. How about the oil adjustment? Can this not be changed?

2—There is no available data as to the advantages such as you describe. Aluminum pistons would assist in reducing vibration and probably slightly increase the power in your motor. Prices depend on who makes them, what size they are, what the design is, etc. Probably around $25 to $35 a set.

ENLARGING VALVES IN FORD CAR

Advantage of Tungsten Steel Where Heat Is a Factor

Brookston, Ind.—Editor Motor Age—Kindly explain how car No. 37 in the Ford races at the Chicago speedway enlarged the valves.

2—Also, how much road clearance did the car have with lowered frame and about how much did the extra parts cost?

3—What is the cost of tungsten valves, and what is the advantage of these valves?

4—Does Goodrich make a 30 by 3½ cord tire?—Edgar Best.

1—The seats were reamed out to a larger diameter with a taper reamer of the correct taper and entirely new valves were fitted to comply with the size of the enlarged valve seat. The exact dimensions we do not know.

2—It is only a guess, but as we remember it the road clearance did not fall short of that on the stock Ford. The owner made the statement that this car was altered for $150. He did all of the work himself.

3—Tungsten valves cost about twice as

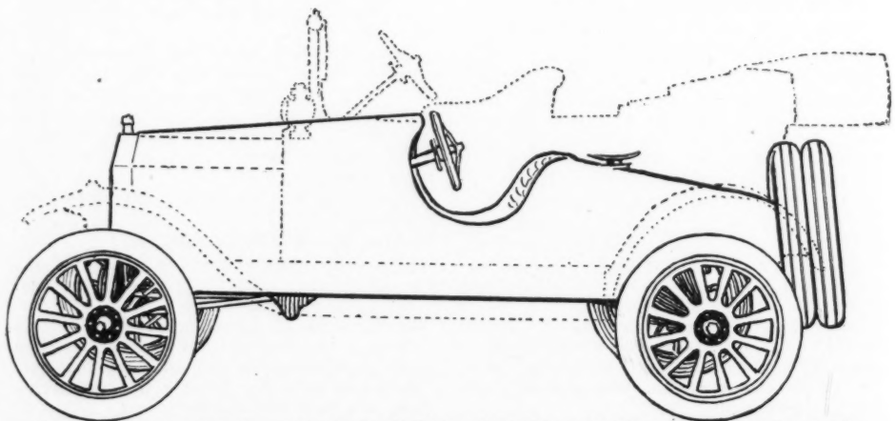


Fig. 2—Sketch suggesting method of rebuilding Ford into speedster with streamline hood and cowl effect

much as ordinary steel valves and their advantage is that they will withstand greater heat and strain without breaking. Their life is also longer.

4—No.

ALTERING THE FORD FOR RACING

Narrowing Tread Will Not Reduce Possibility of Skidding

Lima, O.—Editor Motor Age—Will narrowing the tread 6 or 8 inches on the rear axle of a Ford built for racing eliminate some of the skidding?

2—What would be the better gear ratio, a 2¾ to 1, or a 3 to 1, on a car to be used on a ½-mile track?

3—In enlarging the valves what would be the best size?—A Reader.

1—No.

2—Very probably a 3 to 1. On a half-mile track rapid pickup is needed and the lower gearing will permit this.

3—The valves cannot be enlarged over ⅛-inch without danger of weakening the cylinder casting to such an extent that it will blow through.

1914 FORD CAR RECONSTRUCTED

Sketch Gives Idea for Cowl Effect and Streamline Hood

Milford, Pa.—Editor Motor Age—Kindly publish plans for changing a 1914 Ford touring car into a racer type with cowl effect and streamline hood.—Charles A. Foster.

In Fig. 2 is published a sketch showing an idea for converting your Ford touring car into a speedster with cowl effect and streamline hood. The body work has been carried down a few inches below the Ford frame to get away from the high stilted effect which is so often evident in home-made speedster bodies on this make of car.

TO REMEDY COMMUTATOR SQUEAK

High Mica Should Be Removed as Described in Motor Age

Goldfield, Ia.—Editor Motor Age—Kindly explain the method of putting in a new intermediate gear in an E. M. F. 1916 model.

2—What can be done to remedy the squeak in a Delco commutator? The bearings are all oiled and in good condition. The starting commutator seems to get a sort of black gum on it. When this is removed by gasoline it does not squeak for a while, but soon starts to squeak again.—Chas. Hanson.

1—There is no 1916 model E. M. F. The Studebaker Corp. absorbed the old E. M. F. several years ago. If you will be more specific as to the model we will gladly give you the information you ask for.

2—Your commutator is covered with a deposit of mica. See the article beginning on page 5 in the October 5 issue of Motor Age for an explanation of this trouble and methods of remedying it. The squeak is undoubtedly due to an improper fit between the brushes and the commutator and if this is dressed down as described in the article above referred to the trouble should cease. Do not put gasoline into your commutator. It is dangerous.

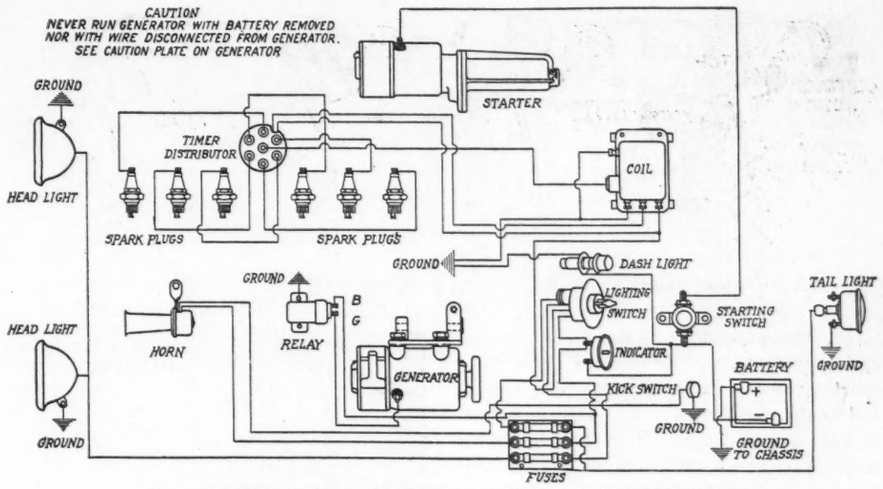


Fig. 3—Wiring diagram of Wagner starting and lighting system

STORAGE BATTERY TO START FORD

Atwater-Kent System for Fords Described and Illustrated

Charles City, Ia.—Editor Motor Age—I have a Hudson super-six which I do not intend using very much this winter. Could the storage battery be removed from this car and used in a Ford delivery car during the winter for starting and lighting? By starting I mean using it instead of dry cells, as it is hard to start on the magneto? Could this be done without injury to the battery if it was kept charged at a battery service station?

2—The Ford is a 1914 model with a delivery body substituted for a touring body. I have had considerable trouble with the rear axle. The bearing in the torsion tube seems to break, thus letting the gears out of mesh and breaking the teeth. Is there any remedy for this?

3—Where could I obtain information regarding specifications of the new Ford truck to be made by the Ford Motor Co., which was mentioned in Motor Age a short time ago?

4—Will Motor Age kindly publish the working method of the Atwater-Kent ignition system for Ford cars?

5—Can a K-W master vibrator be connected without using the four cells in the box on the dash? If so, please show how.—A Subscriber.

1—The battery could be used for lighting but it is not recommended that it be used for ignition if the magneto also is to be used. If the magneto were not used and a distributer attached to be fed by the battery, the system would work all right. There is no successful way of wiring a battery to work in conjunction with the Ford magneto.

2—A reinforcing bearing, such as was recently described in the accessories department of Motor Age, would probably eliminate this trouble.

3—There is no definite information available at this date regarding the new Ford truck.

4—The Atwater-Kent system for Fords is used in place of the standard flywheel magneto. It consists of a unisparker with a special gear cover to fit in the place of the standard Ford gear cover, a spiral drive gear, an Atwater-Kent coil with switch complete, flexible cable to go between the unisparker and the coil and incidental equipment. The complete system for a set spark control, as it is applied to the Ford car, is shown in Fig. 6. The wire from the top of the distributor lead to the battery and plugs.

The operation of the unisparker is shown in the four views in Fig. 5. This consists of a notched shaft, one notch for each cylinder, which rotates at one-half the engine speed, a lifter or trigger which is pulled forward by the rotation of the shaft and a spring which pulls the lifter back to its original position. A hardened-steel latch and a pair of contact points complete the device. The four views show the operation of the contact maker very clearly. It will be noted that, in the first sketch the lifter is being pulled forward by the notched shaft. When pulled forward as far as the notch will carry it, as in the second sketch, the lifter is suddenly pulled back by the recoil of the lifter spring. In returning it strikes against the

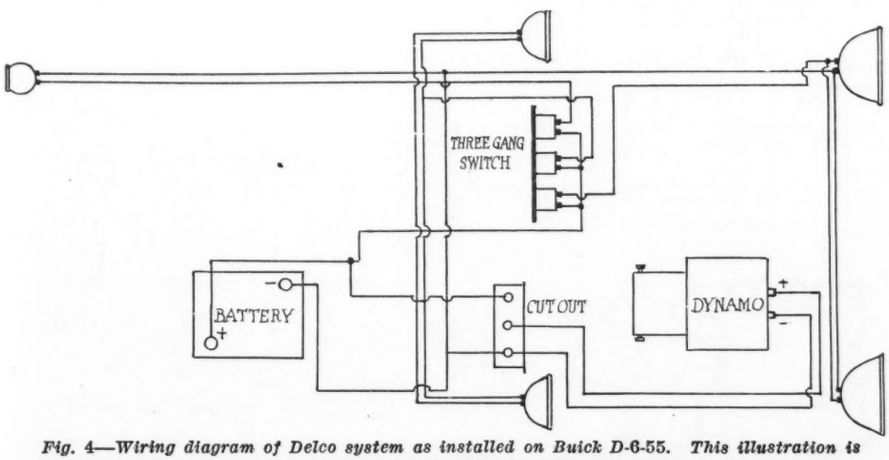


Fig. 4—Wiring diagram of Delco system as installed on Buick D-6-55. This illustration is printed at the request of G. H. Moede, whose inquiry was answered in last week's issue

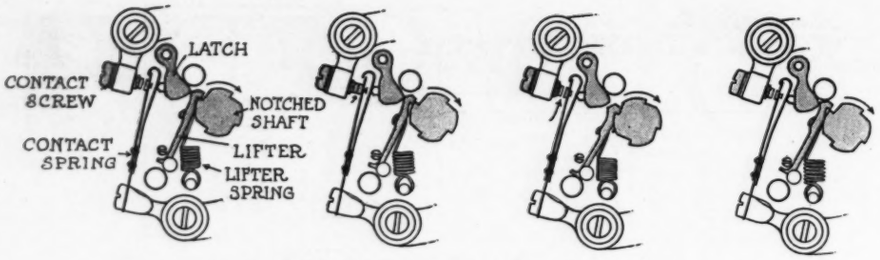


Fig. 5—Diagrams explaining the Atwater-Kent unisparker as applied to a Ford car

latch, throwing this against the contact spring and closing the contact for a very short time—so quick that the eye cannot follow the movement. The contact is made in the third sketch. The fourth sketch shows the lifter ready to be pulled forward by the next notch.

5—No.

ADVANTAGE OF MUFFLER CUTOUT

Car Will Pull Better With Muffler On Than Off

Floresville, Tex.—Editor Motor Age—Does the Hudson super-six use Timken rear axle?
2—How long has the Hudson Motor Car Co. been making motor cars?
3—How long have they been making sixes?
4—Please give me the advantages of a cutout. Does it help the motor?
5—Please explain why a car will not pull as well with the muffler off as it will with it on.
6—What kind of a cooling system does Hudson super-six use?—W. B. McDaniel.

1—Yes.

2—The first models appeared in 1910.

3—The first six was a 1913 model.

4—A cutout is advantageous in that it relieves the back pressure. Back pressure means pressure of burned gas in the exhaust pipes. With this pressure existing the pistons, in compressing the burned gases out of the cylinders through the exhaust valve, have less chance of completely ridding the cylinders of all the gas. The muffler is constructed to stop the speed of the discharging gases. It is the concussion caused by these gases that makes the noise and if the concussion is reduced the exhaust is naturally quieter. A cutout gets rid of a good deal of back pressure and as a direct consequence makes the car noisier.

5—It will. A car with the muffler off will pull better. The trouble must be located somewhere else.

6—Cooling is by pump actuated from the generator shaft.

QUESTIONS ON BUICK DIMENSIONS

Figures on Gasoline Mileage and Speed Not Available

Clear Lake, Ia.—Editor Motor Age—Last fall Buick literature gave the bore and stroke of the 1916 six-cylinder D-44 and D-45 as being 3¼ by 5, while later in the season, for instance at present, the bore and stroke is given as 3¼ by 4½. Has there been a reduction stroke on the later cars or is there an error somewhere?
2—Is it possible to use a 33 by 4 tire on a Buick D-45 which now carries a factory equipment of 32 by 4 tires?
3—How far ought this car to run on a gallon of gasoline on ordinary level country roads?
4—What speed is claimed for this car?—G. T. Buell.

1—The models D-6-44-45 motors have a bore of 3¼ inches and a stroke of 4½ inches, and the Buick factory states that they are unable to find anything to the contrary in any of its literature. If such has appeared it is in error. However, the D-6-54-55 motor has a bore of 3¾ and a stroke of 5 inches and it is possible that these two have been confused.

2—Yes. Oversize tires are perfectly practical.

3—It is impossible to make an accurate statement regarding the gasoline mileage of this car.

4—As explained in the clearing house section of last week's Motor Age it is impossible to give statements of speed without having data regarding official records. There is no such data concerning this car.

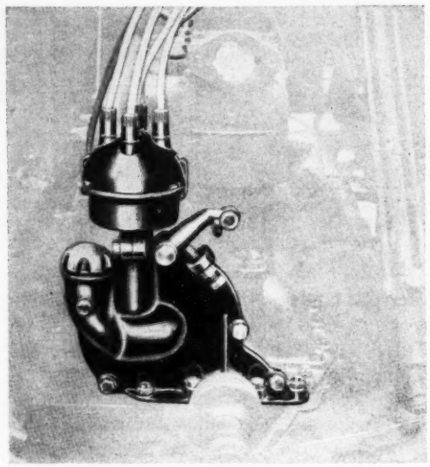


Fig. 6—Showing location of Atwater-Kent ignition system as applied to a Ford motor

Fig. 7—Phantom view of speedometer operated by air from pump swinging dial against resistance of hair spring

TRANSCONTINENTAL RECORD TIME

Record Is Based on Elapsed Time—Stops Not Taken Out

Greensboro, N. C.—Editor Motor Age—In your September 28th issue of Motor Age I learn that a Hudson super-six went from San Francisco to New York in 5 days, 3 hours and 31 minutes. Was this a stock car having absolutely no special parts?
2—Did the drivers stop or did they drive continually, night and day, and just stop when absolutely necessary?
3—How many hours actual running did they consume from San Francisco to New York?
4—How many hours actual running did the Cadillac 8 consume from San Francisco to New York, when it made the trip in 11 days, 7 hours and 15 minutes?
5—Did the Cadillac have more than one driver?—A Reader.

1—This was a stock car.

2—The car was driven continually. The drivers relayed the car across the country without stops being made.

3—The time you state in your question 1.

4—The time you state was the actual running time.

5—Yes.

SPEEDOMETER OPERATED BY AIR

Instrument Utilizes Small Pump to Furnish Power for Speed Register

Beaumont, Tex.—Editor Motor Age—Explain how the Van Sicklen speedometer is operated.
2—Does Motor Age know of a company putting out or going to market a car with a magnetic control?
3—Is the Hudson Super Six tuned up before racing?—A. R. Eader.

1—This speedometer utilizes air as the medium of transmission of motion. In general design the instrument comprises a small rotary air pump, which maintains air pressure in proportion to the speed of the vehicle, the speed indication and distance indicating head on the dash operated by air pressure, and the small flexible pipe connecting them. The speed dial is the float-

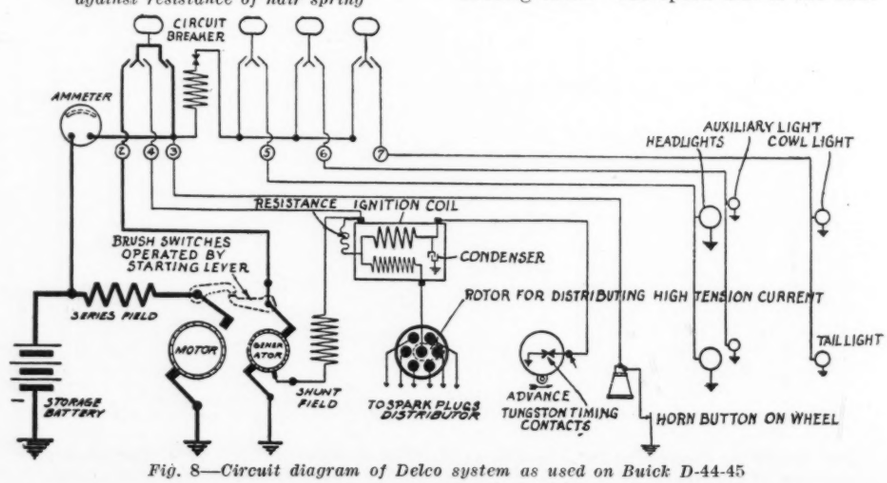


Fig. 8—Circuit diagram of Delco system as used on Buick D-44-45

ing type, balanced to 1/400,000 of a pound. The illustration in Fig. 7 shows the interior construction of the instrument. The air enters through the needle valve shown in the center and forces the speed dial ahead by the pressure of the air. The spring shown above the needle valve is adjusted to act as a brake against the air pressure pressing against the plate in the dial, and thus holds the indicating dial to the location where the correct speed is shown.

2—The Owen-Magnetic, made by the R. M. Owen Co., 5th Ave., and 142nd St., New York, is a car with a magnetic control.

3—Yes. Any car is tuned up if it is entered in a race. The stock construction is observed in almost every particular in the Super Six racers. Parts are, of course, considerably lightened.

CUTOUT RELAY IS INOPERATIVE

Advised That Reader Does Not Attempt Repair Himself

Eunice, N. Mex.—Editor Motor Age—Would a Stromberg carbureter give satisfaction on a 1916 model 25 Maxwell touring car?

2—The cut-out relay on this car will not let the current from the generator pass to the storage battery. I can hold the cut-out relay closed with screwdriver and it will charge. How can this be remedied?—Conner Carson.

1—Yes.

2—Communicate with the makers or with the nearest Maxwell service station and ask them where the cutout should be sent for repairs. Do not attempt to do the work yourself. It is a very delicately adjusted instrument and you might ruin it.

Give Wiring Diagrams

Edwardsville, Ill.—Editor Motor Age—Kindly publish a wiring diagram of the electric starting, lighting and ignition systems of the Buick eight six, Buick four, Saxon six and Chevrolet.—V. G. Schwarz.

These diagrams are published in Figs. 9, 11, 3 and 10 respectively.

Wire and Wood Wheels

Farmer City, Ill.—Editor Motor Age—Are wire wheels easier on tires than wooden wheels, and if so, why?

2—Does a tire get hotter on wire wheel than on the wooden wheel?—Lance Jones.

1—Because of the great number of small spokes in the wire wheels compared with the fewer large ones in the wood wheels, it is claimed that the wire wheels have greater resiliency and are for this reason easier on the tires. It is the same principle as applying a number of small springs in upholstery instead of a few large ones. Each part of upholstery has a better springing action.

2—No.

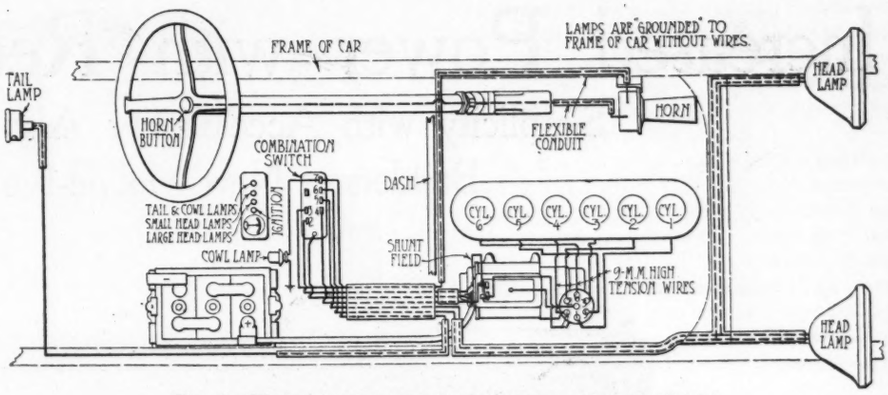


Fig. 9—Wiring diagram of Delco system on Buick D-6-54

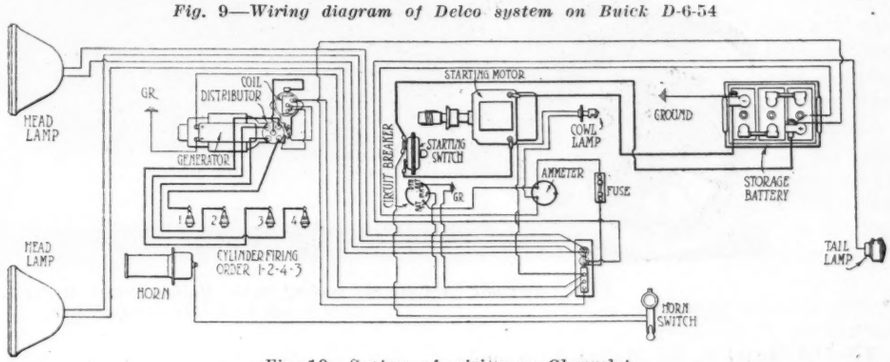


Fig. 10—System of wiring on Chevrolet

Communications Received and Inquiries Answered

Gus Ruckardt.....New Hampton, Ia.
C. H. Johnson.....Friars Point, Miss.
A Reader.....Milton, N. D.
Edgar Best.....Brookston, Ind.
A Reader.....Lima, O.
Charles A. Foster.....Milford, Pa.
Charles Hanson.....Goldfield, Ia.
A Subscriber.....Charles City, Ia.
W. B. McDaniel.....Floresville, Tex.
G. T. Buell.....Clear City, Ia.
Henry Trollio.....Canton, Miss.
A. R. Eader.....Beaumont, Tex.
A Reader.....Greensboro, N. C.
H. D. G.....New Braunfels, Tex.
V. G. Schwartz.....Edwardsville, Ill.

No communication not signed by the inquirer's full name and address will be answered in this department.

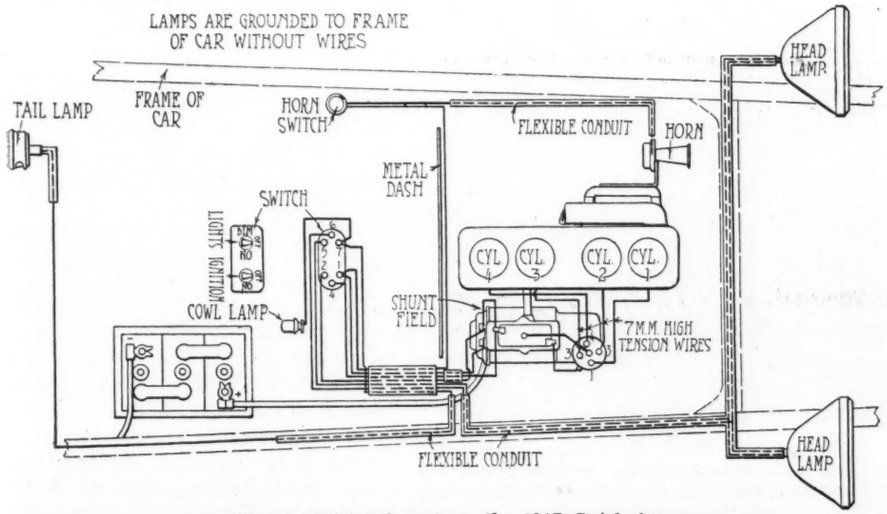


Fig. 11—Wiring layout on the 1917 Buick four

Anti-Freeze Solution

Zearing, Ia.—Editor Motor Age—What effect does denatured alcohol have on radiators?

2—Give formula for anti-freezing solution for radiators.—Earl E. Allen.

1—No ill effects. Its disadvantage is that it evaporates rapidly.

2—See article on page 26 in this week's issue.

Running Motor at Angle

St. Catherine, Can.—Editor Motor Age—Kindly give the number of revolutions per minute of the engine in the Model 42 Oakland car.

2—Would it be possible to run this engine at an angle of 5 to 7 degrees?—L. C. Jones.

1—The maximum revolutions per minute of this motor would probably not be over 1,800.

2—If you mean slanting sideways, yes, if lengthwise, it would not be advisable inasmuch as it embodies the splash system of oiling and the front cylinders would run dry.

Leaving Ford Switch On

Victor, Ia.—Editor Motor Age—Will it wear out the magnets on the flywheel of a 1916 Ford if the ignition switch is left on?

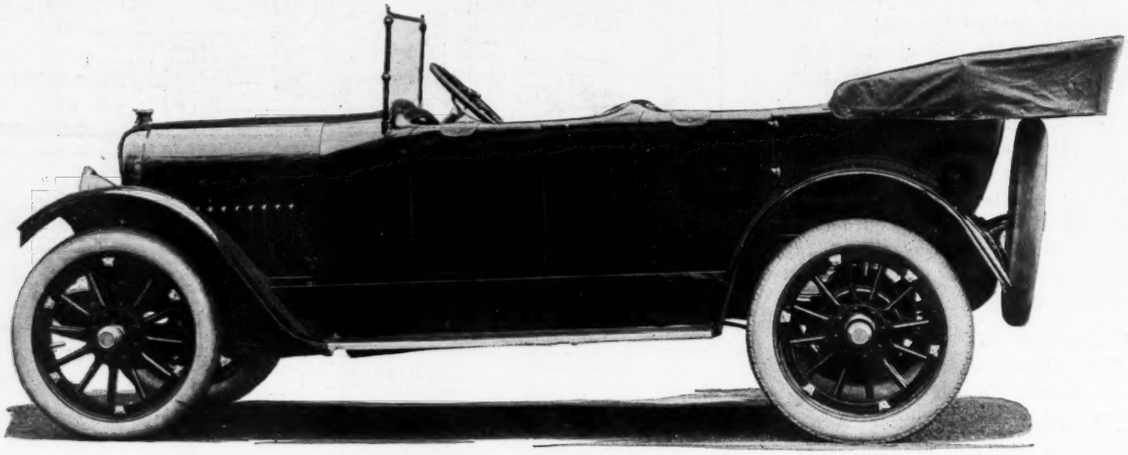
2—What would cause the lights on the Ford car to burn bright at high speeds, and if the speed is retarded and accelerated again, the lights will not brighten again, but if the engine is stopped and started again the lights will again be bright?—O. E. Raffensperger.

1—No. It is not advisable to throw the switch on after stopping the motor. The car may be left in gear and if some one has occasion to push it it is liable to start.

2—Such a condition is hard to understand. We have never heard of such a thing before and can offer no explanation.

Increased Power with Reduced Weight

Simplicity with Accessibility Also Aim of Builders of New Moline-Knight



Straight lines are not evident in the Moline-Knight Model G. The double cowl is new with this manufacturer

IN ITS Model G, the Moline Automobile Co., East Moline, Ill., has combined the salient features of its two 1916 models into a comparatively light-weight car with a high-powered motor. The motor has the same bore and stroke as the Model 50, which was the large car of last year, but it is a very new motor in a number of features of its design. Simplicity and accessibility has been the keynote in the design. The price is $1,750.

So new is the car in its chassis, motor and body that comparison with the previous two models is difficult. With all, however, it withholds the Moline-Knight principle of design.

Changes in Knight Motor

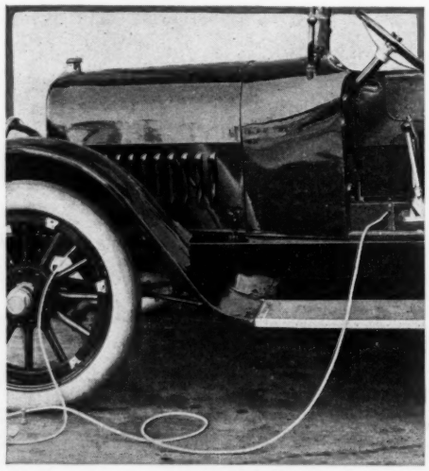
The Knight motor is internally the same as the Model 50, with its 4-inch bore and 6-inch stroke. The most noticeable exterior change is the substitution of a Connecticut distributer utilizing battery ignition in place of the magneto of the previous model. The distributer is worm-driven off of the eccentric shaft which actuates the sliding sleeves and the same shaft which drives the distributer extends into the crankcase and drives a new type of oil pump which is another departure from Moline practice.

Oil pressure in the Moline-Knight is no longer controlled by the throttle. In the previous models a lever in unit with the throttle lever opened and closed the pump with the purpose of giving a uniform addition of oil pressure with the acceleration of the car. In a few instances it was found that owners had difficulty in understanding this arrangement and abused it by mis-adjustment. As a result a gear pump has been substituted which gives increased oil pressure by the acceleration of the driving shaft.

The new silent-chain system for driving the cams is a two-point instead of a three-point type. In the Model 50 one chain acted through three sprockets, a drive sprocket, cam-actuating sprocket and generator-driving sprocket. The new method is to drive the cams from one chain and the generator from another.

The exhaust manifold is now constructed to permit separate exit of gases from each of the four cylinders. This is accomplished with the use of a casting with ports to each cylinder which surplants the manifold which took care of two cylinders in one port. Better scavenging is the claim for the new principle.

The new intake assembly embodies a hot-air pipe which reaches over the top of the cylinders and connects on one end with a stove on the exhaust manifold and on the other with the air intake of the carbureter. The stove assembly is purely a cold weather fixture and it is the purpose of the makers to have it removed for summer driving.



The tire pump on the new Moline-Knight has its nozzle projecting through the floor board and its operating handle beside the shifting lever

The new crankcase is built in two halves instead of one casting as in the 1916 Model 50. Maximum accessibility is the claim for this construction because it is only necessary to remove the oil pan to permit the complete removal of all the connecting rods and pistons.

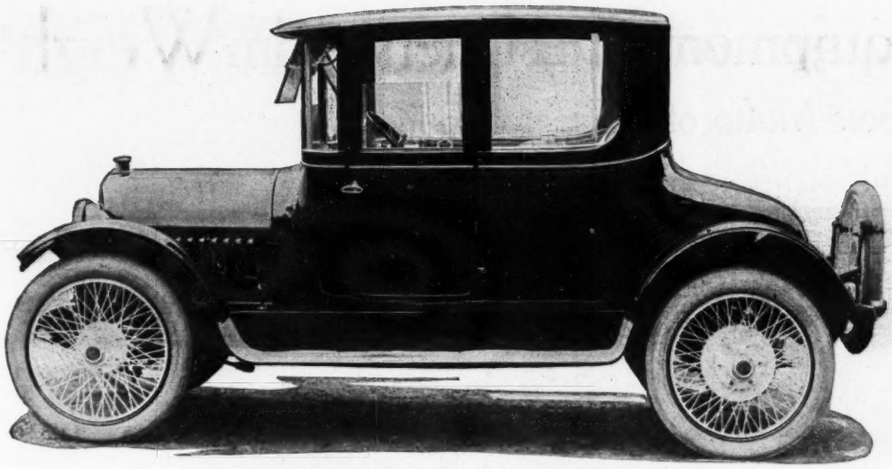
Breather Pipe Location

Another step in the way of accessibility is the new location of the combination oil filler and breather pipe. This has been located on the crankcase arm instead of in the center. With the old design the oil filler came directly under the water pipe making it somewhat difficult to pour in the oil. The cast-aluminum fan has been discontinued and in its place is a pressed steel fan operating on a swinging bracket which permits ready adjustment.

All of the above-mentioned features constitute a change of the larger car to comply more nearly with the specifications of design of the Model 40, which was the small car of last year. This will be continued with a few alterations which will be announced later.

Something entirely new, however, is the adoption of the Bendix system of starting-motor drive in place of the manual shift which has characterized previous models. This was adopted, for one reason, because of its greater simplicity, there being several less parts in the Bendix shaft assembly than in the manual shifting device of the former models.

Turning to the electrical system, there is another marked change from the Model 50 equipment. Wagner still makes the



Coupe body on the Moline-Knight Model G chassis

generator, but it is a 6-volt instead of a 12 and the wiring has the ground return principle instead of the two-wire system of the previous model. This is another step towards simplicity which has been the goal of the Moline engineering staff in the building up of this new model. The starter is an Auto-Lite.

Gearset Mounting

The conventional three-speed gearset is still mounted some distance back of the motor and connected with the motor through two universals. These universals, however, are of Moline make in this latest model. The gearset is Brown-Lipe.

The rear axle is the floating type with spiral-bevel drive, much the same in construction as the 40, but proportionately larger to take care of the additional motor power and weight in the new car. The gear reduction in the differential is 4 to 1 instead of 4.33 to 1 as on the 50. This higher gearing is possible because of the decreased weight with a motor of the same size and even higher efficiency. The front axle is a duplicate of the large car of 1916.

The characteristic double-compounded semi-elliptic spring design is retained in the Model G. The springs are transverse and there are two of them, one above the other. They are of slightly different length and so of different deflection period. The upper has a shackle attachment to the frame at one end and a pin at the other, and the lower has corresponding attachments to the axle. The effect of these two springs is to provide a very flexible suspension and yet roll and jumping is eliminated by the difference in deflection period. One spring damps the other, so to speak, when a severe shock is transmitted from the wheels.

A new accessory which alters another principle of design is the installation of a Stewart vacuum tank which surplants the pressure system of the Model 50. Gasoline is contained in a round tank instead of a square one and this tank is ingeniously fitted into the rear frame assembly and held in place by steel straps. The tank is fitted with a magnetic gasoline gauge.

The Brush chassis and frame design in which the side members of the frame were extended to form the running boards is not evident in this model. Instead the running boards are of wood. The shape of the frame, however, is similar to the previous models with the size altered to take care of the new chassis.

The tire pump mounting shows another well-planned effort to bring all accessories within easy reach. This is mounted on the gearset so that the hose may be screwed into the nozzle without lifting the floor boards. The pump-operating lever is located at the side of the gear-shifting lever. In previous models the pump was under the hood and driven from the fan gear.

The new body marks Moline's acceptance of the double-cowl. It is by far the most beautiful body that these makers have yet produced. With a rolled-in edge sloping into the rear cowl, a rounded back, front cowl blending into the hood, crowned fenders and the characteristic all-curved line Moline-Knight radiator, the new car is entirely lacking in straight lines and has a massive, comfortable appearance.

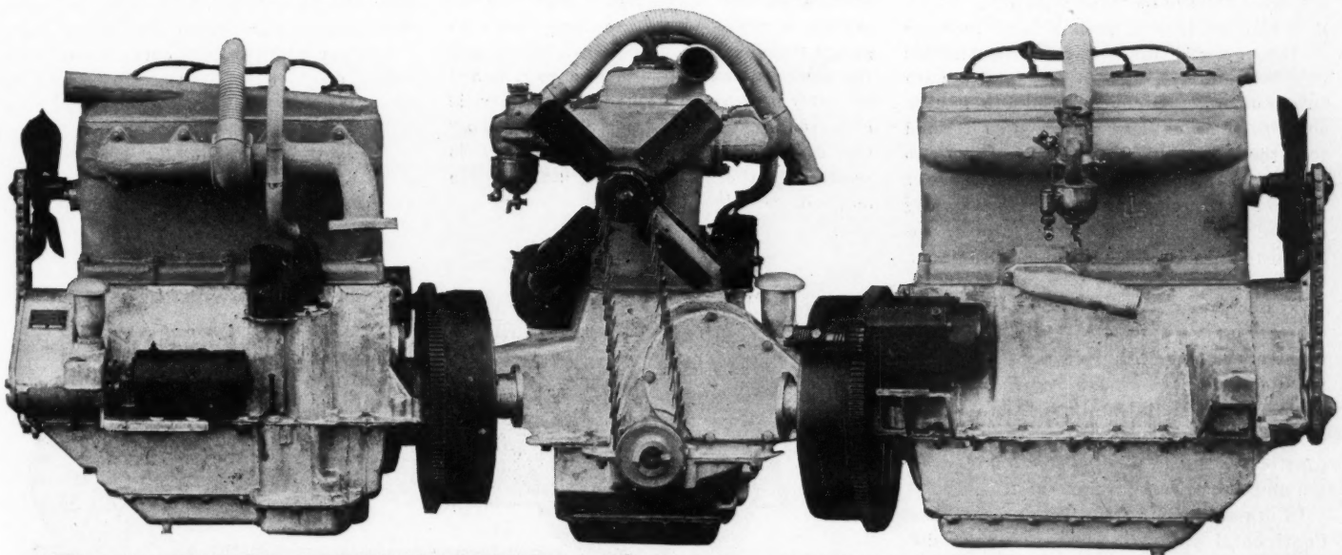
Deeper Seats

The sides of the body are 1½ inches higher than in the Model 50 permitting lower seating of the passengers within the body which is becoming so much demanded. The upholstery is buttonless and deep. A mahogany panel has been fitted on the back of the rear cowl and in this are two flush rear-seat lights, one on each side.

The windshield has been given a slight slant, hardly perceptible yet just enough to further carry out the effect of a total absence of right angles.

The spare tire is carried on a ring which serves the same purpose as a rim, that is the tire and demountable rim are bolted directly onto it. A locking device is fitted. This same assembly carries the tail lamp and license bracket.

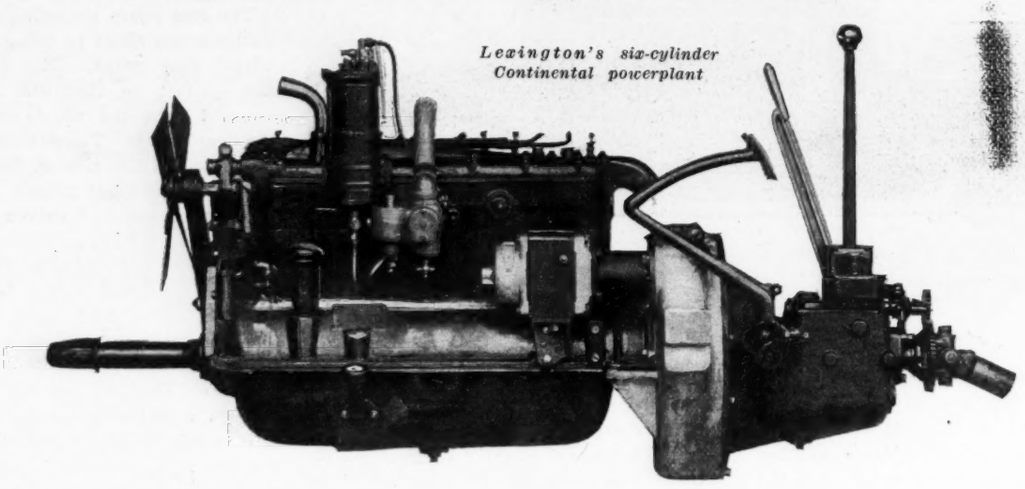
Because of its lighter weight the Model G is fitted with 35 by 4½-inch tires.



Left, front and right side of Moline-Knight Model G motor. The Wagner generator is located where the magneto was to be found previously. The distributor is driven by worm from the eccentric-operating shaft and the lower end of the distributor shaft drives the oil pump. The exhaust manifold is new, as is the pressed- steel fan, which is located on a swinging bracket, and the hot-air tubing attachment

Detail Equipment Designers' Aim

Completeness Motto of Lexington Builders



Lexington's six-cylinder Continental powerplant

THE aim of the maker of the Lexington sixes, the Lexington Howard Co., Connersville, Ind., is to produce cars of high finish and excellent detail equipment. The chassis are made up of well-known units, but it is the manufacturers' claim that the design has an unusual coherence for an assembly proposition, the reason being that several of the parts factories whence the Lexington company obtains its supplies are owned and operated by the same business heads.

Two Chassis, Several Bodies

There are two different chassis, on which a fairly wide range of body styles are mounted. The smaller is known as the Minute Man Six and sells for $1,185 and the larger is termed the Thoroughbred, costing $2,875. Both have Continental engines, the smaller 3¼ by 4½ inches and the larger 4⅛ by 5¼ inches, but there is a special feature on these motors for which it is claimed that it gives a large increase in the power. This is the Moore multiple exhaust manifold, used in conjunction with two mufflers. Briefly, this Moore system consists of an exhaust manifold so divided that the exhaust from one cylinder has no possibility of interference with that of the next. On the contrary, the escaping charge from one cylinder is actually believed to exercise some suction on the next. In six-cylinder engines where there is always one exhaust valve open and two open together at very frequent intervals interference most certainly does take place with the conventional exhaust system and it is a remarkable thing that the Moore system or some other device with a similar aim is practically never used except on Lexington and one or two foreign cars.

In other respects the engines are typical Continental products. The two sizes differ a little in detail, but not very much, both being pump cooled. Lexington equips the larger with two separate ignition systems and twelve spark plugs, the smaller having only one distributor, but this is built into the engine and is not a part of the generator. The electric generator is located on the water pump side of the engine, and is driven by a quick detachable coupling specially designed to give soundless operation.

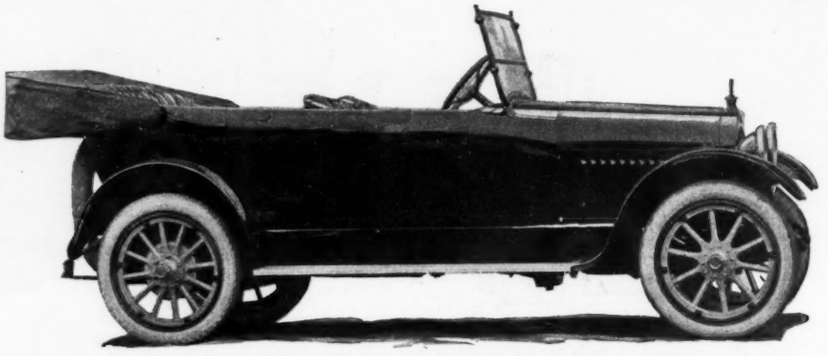
Each of the three main bearings of either engine, gets its supply of oil forced direct from the pump, dip troughs being filled by the same pump for supplying the connecting rod bearings and other parts of the motor by splash. The carburetors are mounted high, with gas passages as short as possible between throttle and cylinder, the fuel being fed by vacuum system in conjunction with a 22-gallon tank at the rear end of the main frame. Care has been taken to provide indicators so that the driver can see at a glance how his engine accessories are operating. Thus the oil system is provided with a large pressure gauge which is set in the cowl board, and the electrical outfit includes a cowl board ammeter showing whether the battery is being charged or not, and also measuring the discharge rate when the battery is used with the car standing and engine stopped.

Each of the two cars has a three-speed gearset but it should be noticed that the more powerful car has a substantially heavier gearbox with wider gears of bigger pitch, in proper proportion to the higher engine power. The clutches are different, as the Minute Man has a multiple dry-disk pattern and the Thoroughbred a special cone clutch of Lexington design which has the leather face hand-ground to a fine surface that fits accurately in the flywheel. The leather has twelve spring inserts beneath the face.

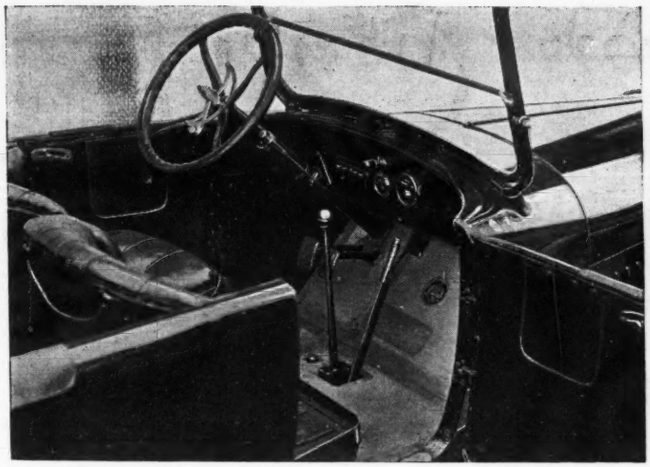
Torque Through Springs

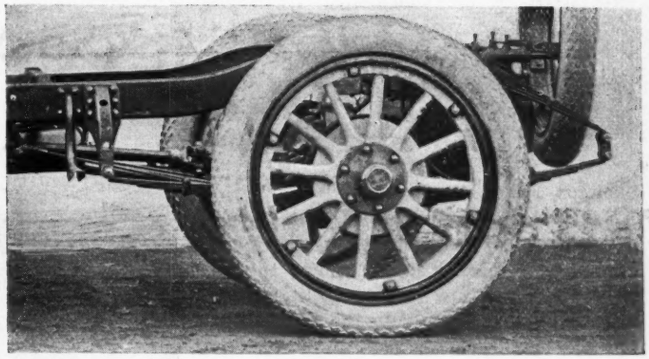
Torque and drive stresses are taken care of by the three-quarter rear springs, the propeller shafts being fitted with universals at both ends. Extra large diameter tubes are used for the propeller shafts to guard against whipping when running fast. The rear springs are 50 inches long and underhung beneath the axle, vanadium steel is used throughout for spring work.

Another place where exceptional material is employed is in the frame and the manufacturers make a special point of drilling the holes in the side rails and applying the rivets so that a particularly good job is made of the frame altogether. All the different brackets are hot-riveted,



Lexington Minute Man six-cylinder five-passenger selling at $1,185 with full equipment. Note divided front seats and Boyce motor-meter





Above—Rear of chassis, showing drop of forward spring end
Left—Driver's compartment of new Lexington, showing divided front seats, ample leg-room and control members

and at several points Lexington uses more rivets for a particular piece than is the conventional practice, this, of course, assisting rigidity and preventing the production of creaks. The front and rear axles are conventional in type except that the former is carefully set to give a caster action to the steering. Final drive is, of course, by spiral bevel.

On the smaller chassis four body styles are available. The five passenger open touring car, which costs $1,185, is finished in dark green, with wheels in cream and chassis with fenders black. The top and side curtains are black leatherette, and the top boot of the same material. The top clips to the windshield, which is set with a slight rake. The equipment is more than usually complete for it includes a tire pump with accurate gauge, a trouble lamp, double bulb headlamps and motor-driven electric horn as well as tire carrier and rim license brackets, etc.

Alternative bodies on this chassis are a convertible type touring car from which the windows can be detached individually. This body has been worked out so that the top really fits the body beneath the lines harmonizing as they do in a fully inclosed body. The color scheme is the same as for the open touring car and the equipment also. This convertible sells for $1,350.

There is an open roadster and a convertible roadster, following the scheme of the five passenger cars, the former costing $1,185 and the latter $1,350, just as the touring car. The equipment is identical except that the roadsters are finished in a deep wine color instead of the dark green. All these bodies mount on the same 116-inch wheelbase chassis and wood wheels with 32 by 4-inch tires, non-skid rear, are standard.

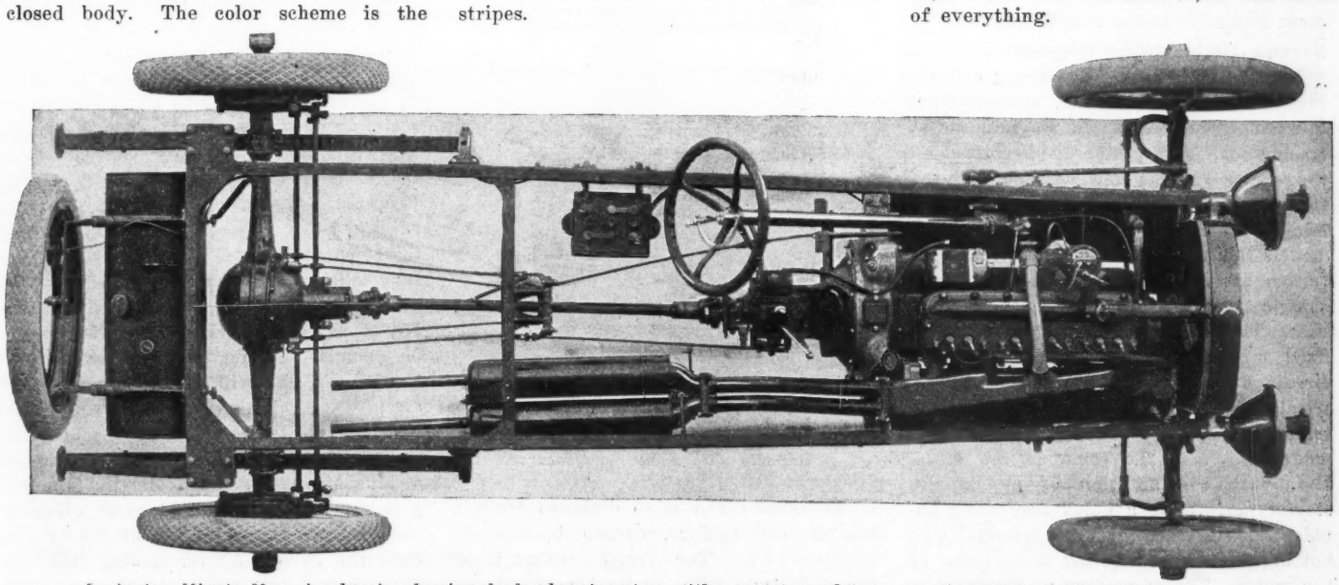
On the larger car there are two standard bodies, a seven-passenger touring and a four-passenger, close-coupled design, called the clubster. The clubster is not a clover leaf, but is a small tonneau job with only two doors, these opening into the rear compartment. The driver and front passenger reach their seats by stepping forward in the aisle. There is a very roomy cupboard in the rear end of this body.

The seven-passenger also has divided front seats. The wheelbases differ, the touring car being 144 inches and the clubster 130 inches. Both have five 36 by 4½ cord tires included in their equipment and both cars are finished in almost any color at customer's option, this extending to the upholstery even. The touring car costs $2,875 and the clubster $2,675 inclusive of everything.

SPECIAL SHOW BUILDING PROBABLE

Dallas, Tex., Oct. 16—A special motor car show building may result from the Southwest's greatest motor car show which opened Saturday, October 14, with the opening of the Texas state fair, and which will continue 2 weeks. A display of machines and accessories, valued at nearly a million dollars, is open to public inspection. It is expected that more than 500,000 people will inspect the exhibits.

Covering a space of 70,000 square feet, in the main building and annex, the exhibit is located on one floor, easily accessible by all visitors. The buildings were not sufficient to accommodate the exhibitors and several dealers were compelled to place their exhibits in tents. The buildings are brilliantly lighted, more than two thousand electric lights being used. Each exhibit is also decorated with streamers of red, white and blue and the stars and stripes.



Lexington Minute Man six chassis, showing dual exhaust system with separate outlet from each cylinder block and two mu ers. This view also shows carbureter hot air intake, storage battery mounting, rear fuel tank and spare tire carrier

The Accessory Corner

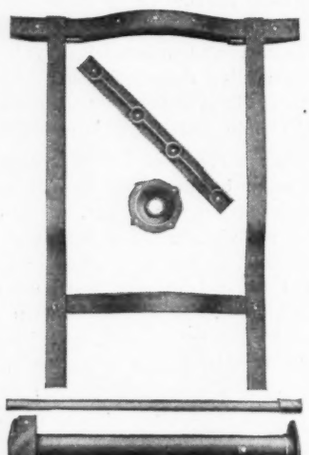
Skeleton Piston Construction

IN THE Pondalloy pistons the head of the piston is supported in the inside by extending a radiating support down to the wrist pin so that any pressure to the piston head is applied directly to the connecting rod and crankshaft. The lower section of the piston is made in a skeleton form, split in a number of joints so that the lower half of the piston can expand and maintain a uniform pressure on the cylinder walls. The skeleton ribs are so shaped that they are said to cut and throw the surplus oil from the cylinder wall to the inside and to the head of the piston, thus preventing an excessive amount of oil reaching the combustion chamber. The wrist pin is retained without cotters, bolts, screws or nuts. An expanding spring placed in the wrist poles, one in each side makes a positive lock and leaves the wrist pin free to turn in the piston and connecting rod. The piston is of alloy material and because of this and its skeleton construction is of very light weight. It is marketed by the Pondelick Piston Ring Co., Leavitt and Jackson Blvd., Chicago.

Skeleton piston of alloy material

Extension for Ford Cars

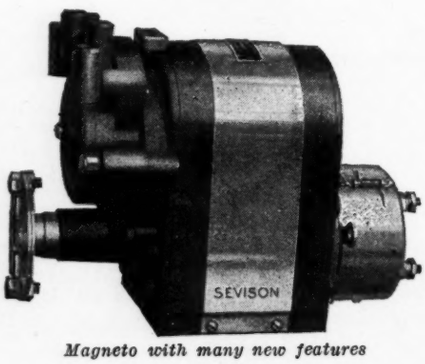
With a wrench, a hammer and a few hours of spare time one can extend a new or a used Ford chassis 15 or 30 inches, converting the 100-inch Ford into a size large enough for truck purposes, is the claim for the H-D extension manufactured by the Hayes-Diefenderfer Co., 237 W. 55th St., New York. The assembly consists of a propeller shaft housing, a frame extension, and the necessary equipment for lengthening the brake rods. There are no alterations necessary on the Ford chassis. The price is $55 for the 15-inch equipment and $60 for the 30-inch extension.



Extension equipment for lengthening Ford wheelbase

Sevison High-Tension Magneto

Non-short circuiting, no pitting or burning of the circuit breaker, an indestructible condenser, permanent magnets, better combustion, more power and less fuel are the claims for the new Sevison high-tension magneto made by the Sevison Electric Co., Elkhart, Ind. There are three models the model H, H.J., and H.I.J. The former has a compound wound laminated-shuttle type armature with a standard base. The H. J. differs in that it has a fixed circuit breaker, set to break the circuit at the highest peak of the electrical wave, fitted with an automatic centrifugal governor for spark control. The model H.I.J. is the same as the model H.J. with the addition of an impulse starter performing a quick oscillating impulse of the armature and producing a hot arc flame spark at the firing point of the motor. The respective prices are $45, $47.50 and $52.50. The distributer is made of condensite and is so designed that it has no coil springs, carbon brushes or wearing parts. The circuit breaker is of the disk type with no working joints or journals in the circuit. The contact points are cushioned to prevent hammer action. Regarding the impulse starter, when the motor is cranked very slowly on compression a quick oscillating impulse of the armature is performed, which produces a hot spark at the firing point of the motor with two impulses to one revolution of the armature. As soon as the motor starts to fire the device automatically releases.



Magneto with many new features

Vapor Gasoline Saver

The hydrovaporizer automatically draws water from the motor and air from the outside, and mixes them in proper proportions, finally injecting this mixture in the form of a vapor spray directly into the manifold, from whence it is drawn into the combustion chamber and explodes with the gas. It is claimed to soften and remove carbon deposits, and because of the cooling effect of the moisture in the cylinders creates a considerable reduction of the gas consumption. The makers guarantee a 25 per cent increase in mileage of gasoline. The price complete is $6. Accessory Manufacturing and Sales Co., 1507 Hennepin Ave., Minneapolis, Minn.

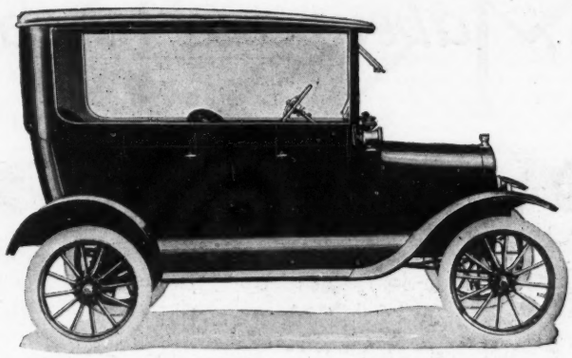
Convertible Tops for Fords

The Motor Products Co., Indianapolis, has commenced manufacture of a convertible sedan top for Ford cars. It is easily attached and the windows can afterwards be removed quickly in fair weather or replaced for bad conditions. It is supplied for $125. This is the first of a series that will be put on the market; tops of similar design for Chevrolets, Overlands, Maxwells, etc., will be shortly added.

Inner Tube With New Valve

Armstrong inner tubes embody the Kahn automatic valve which will not permit a pressure above a certain number of pounds. The valve is made in two parts to allow for the removing or replacing of the valve stem and to allow for the assembling of the valve when manufactured. The valve seat is the only point at which air can enter or escape from the tire. The valve stem fits through a hole in the body of the valve. The rubber joint evident in the common types is eliminated. There is a collar in the top of the valve which has a projection which may be fitted into any of five slots marked, 50, 60, 70, 80 and 90 pounds. Setting this projection into the proper slot will regulate the desired air pressure. When a pressure which corresponds to the setting is reached the check valve closes due to the opening of a blow-off valve, thus relieving the air pressure from the outside and allowing the pressure on the inside of the tire to close the valve. All air coming from the pump above this pressure passes through a port outside. The escaping gas makes

Tire valve which regulates pressure automatically



Convertible sedan top for use on Fords

a whistling noise, thus giving warning that the tire has the proper pressure. Armstrong tubes equipped with the Kahn valve are a product of the Armstrong Rubber Co., Inc., 122 Adams St., Newark, N. J.

Visible Gasoline Pump

Features of a new type of gasoline pump are: A glass cylinder which enables the customer to see that he is getting accurate measure, elimination of hand pumping by use of an electric motor, which may be installed inside or outside of a building; holds no gasoline in the hose, holds no gasoline above ground, and may be operated either inside or outside of a building. The price of the outfit illustrated is $255 and it is a product of the Guarantee Liquid Measure Co., Pittsburgh, Pa.

Honn Babbitting Jig

The Honn Babbitting jig is useful for babbitting connecting rods; also for determining the true alignment of the two pins. A metal base carries two fixed uprights holding the crank pin bushing, and adjustable V-block carrying the wrist pin bushing. Four shafts and eight collars are furnished to fit various sizes of connecting rods, the piston pin being used for the upper end of the rod. All parts are made very accurately, and permit the jig to be used for obtaining true alignment of the pins. The makers are Honn & Son, 578 Stocking Ave., Grand Rapids, Mich. Price of complete set $15.

Steering Wheel Ford Lock

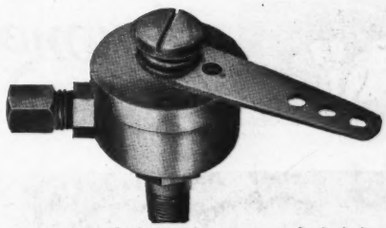
The Reliance Company, 429 W. 38th street, Chicago, is now marketing a new pattern of its steering wheel lock for Ford cars. An important detail of this lock is the method of operation by which no matter how great a strain may be applied in an effort to turn the steering wheel, no damage can result to any part of either the steering gear or the lock itself. The locking device is a ten tumbler lock by the action of which a steel bolt ⅛ inch long and ¾ inch wide is thrust downwardly into a notch in a disk, thereby locking the

Gasoline filler with visible operation

disk to the steering post and preventing turning of the wheel. Each lock requires an individual key and there is no master key nor can one be made. Price, $5.

Goodrich Auto Switch

The Goodrich switch for Fords is operated by a Yale lock. The device takes the place of the regular ignition switch, and may be attached in little time, as its screws fit the screw holes already in the coil box. The switch cannot be removed



Device to admit water, vapor and air into cylinders

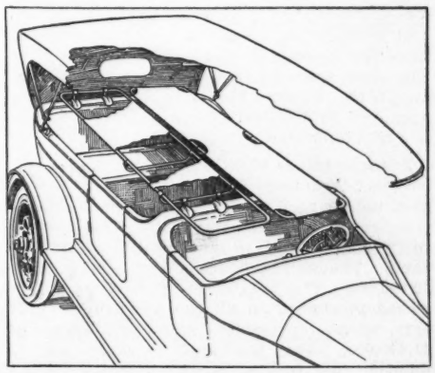
when locked, as metal shutters cover the screw heads. Throwing off the current to stop the motor locks the switch, thus removing the possibility of forgetting to lock the switch. Two keys come with each switch. The lock is made by the Goodrich Accessory Assn., 809 Widener Bldg., Philadelphia and the price is $3.25.

F. & R. Car Vise

The F. & R. is a swiveled base vise having a clamp permitting attachment to the running board. The jaws are steel-faced and tempered, 2 inches in width and may be opened 2 inches. The weight is 7½ pounds, and the construction very compact, permitting the vise to be carried beneath the rear seat. This vise can be adjusted to any position and both swivels are locked when the work is clamped between the jaws. It is marketed by the Fulton Machine and Vise Co., Lowville, N. Y., Price $8.50.

Motor Cot Fits Any Car

The first aid auto cot was designed primarily for emergency use by physicians in converting a standard touring car into an ambulance. The cot will fold to a size of 3 feet by 2 feet, and when open brackets or legs, which are adjustable, fit onto the backs of the front and back seats. The weight is 12 pounds. It has other uses than this according to the makers. A traveling salesman who makes his territory in a machine can reduce expenses and be independent by sleeping in one of the cots. He can carry it folded away into the tonneau department. Tourists may make the same use of it. The cot, when folded, is enclosed in a canvas cover which is dust proof and keeps the interior clean and sanitary. The frame of the cot is made of galvanized tubing and is rigidly braced. The any kar auto cot is a product of the Peoria Aut-Kot Co., Peoria, Ill.



Adjustable cots for physicians or tourists

Among the Makers and Dealers

ROAMER HAS EXHIBIT IN HOTEL.—This exhibit of Roamer cars opened October 2 in the Elizabethan room of the Congress hotel, Michigan avenue, Chicago, and more than 5,000 visitors saw the display. At the conclusion of the show Saturday night, the cars were driven down Peacock Alley of the hotel and on Sunday made a trip over the boulevards, carrying a party of the officials of the company and local newspaper men.

GEMCO to Market Direct—The Gemco Mfg. Co., Milwaukee, Wis., which heretofore has marketed its products through manufacturers' representatives, hereafter will market direct.

Keleher Buys Interest in Agency—A. C. F. Keleher, a pioneer motor truck salesman, has purchased a half interest in the Pierce-Arrow agency in Pittsburgh and will be associated with H. H. May there. The firm will be known as the May-Keleher Co.

Dechant Case Ad Manager—George A. Dechant, Harrisburg, Pa., has been appointed advertising manager of the J. I. Case T. M. Co., Racine, Wis., to fill the vacancy caused by the resignation of Bertholf M. Pettit, who has joined the staff of the Curtis Publishing Co., Philadelphia.

Cleveland Dealers Adopt Standard Service—Dealers have formed an organization and enlisted the co-operation of the various factories located in and about Cleveland, O. The first work of the body was formally to adopt the standard service policy recently approved by the National Automobile Chamber of Commerce.

Autocar Issues $1,250,000 Bonds—The Autocar Co., Ardmore, Pa., has issued $1,250,000 first mortgage 5 per cent serial bonds dated October 1 and maturing from April 1, 1917, to October 1, 1921, in installments of $125,000 each. The capital stock of the company is $2,000,000. The bonds are secured by a first closed mortgage on all the company's property, whose replacement value is in excess of $1,400,000. For the last 2 years and 8 months net profits of the company have averaged $500,000 per annum, after making ample allowance for depreciation. This is equivalent to eight times the interest requirements on the new bond issue.

Chevrolet Agent to Open Service Station—C. R. Brandon, Litchfield, Ill., has opened a sales agency and service station at Springfield, Ill., and will be distributor for the Chevrolet car in three counties.

Hall-Thompson Co. Builds.—The Hall-Thompson Co., Hartford, Conn., having outgrown its quarters, plans the erection of a three-story brick building of mill construction. The new building may be ready the first of the year.

McCurdy to Sell Jordan Car—Robert McCurdy has become the Pennsylvania state distributor for the new Jordan luxury car. Mr. McCurdy formerly sold the Pierce-Arrow in Pittsburgh. His headquarters will be in Philadelphia.

English Company Sells—The Leath Motor Car Co. has bought out the English Motor Car Co. and will handle the King and the Dort cars on the coast. The cars will be marketed through the former English company's organization, which has been continued practically intact by the Leach company.

Will Try for Bond Issue—The William Penn Highway Association has started a movement to have Pennsylvania again vote on a $50,000,000 good roads bond issue in 1918. This proposition was defeated 3 years ago because of opposition from farmers. Efforts are also being made to appropriate $5,000,000 annually for 2 years at the next session of the Pennsylvania legislature, these funds to be added to the income from motor car license fees and other sources to increase the funds available for the state highway department.

Waukesha Motor Addition—The Waukesha Motor Co., Waukesha, Wis., will break ground October 15 for the erection of a new office building and draughting shop.

Kershner to Cadillac Truck Company—J. H. Kershner, formerly district manager for the Dart Motor Truck Co. of Waterloo, Ia., has been appointed special factory representative of the Cadillac Auto Truck Co., Cadillac, Mich., with headquarters at Norton, Kans., and will cover Kansas, Nebraska and Colorado.

Dimming Devices Are Demonstrated—Nine manufacturers accepted the invitation of the Automobile Club of Hartford, Conn., for a public demonstration of dimming devices at Charter Oak Park this week. Each device was given a separate trial, after which lunch was served by the club at the Allyn House. The various representatives then explained their devices. About 200 witnessed the trials.

Radiator Company Adds—The Perfex Radiator Co., Racine, Wis., manufacturer of pleasure and commercial cars and tractor radiators and cooling systems, dedicated a new shop recently with a party of employes and their families and friends. The capacity is increased to 400 radiators a day by the improvement. At present its orders are of such volume as to insure a continuous capacity

run until the end of next year. More than 150 men are employed. The new plant represents an investment of $45,000 to $50,000.

To Build $25,000 Garage—The Elsen-Philips Auto Co., LaCrosse, Wis., has completed plans for the erection of a $25,000 garage and service station.

Gas Engine Company to Reopen—The Simple Gas Engine Co., Ashland, Wis., is preparing to resume operations after an interruption of nearly 8 months, during which time the design was entirely changed and plans made for a large production.

Malleables Company Adds—The Western Malleables Co., Beaver Dam, Wis., which introduced a line of motor car parts several months ago to supplement its output of railroad and other malleable castings, is building a 53 by 120-foot addition, a new core room 90 by 26 feet and a new sand shed.

Tractor Company Moves—The Waterloo Boy Kerosene Tractor Co. has moved its headquarters from Chicago to Bloomington, Ill. A branch office had been maintained in the latter city for some time. The officers believed it to be advantageous to be located in the heart of an agricultural community, and the change was authorized.

New Tire Company Output Soon—The Gillette Safety Tire Co., Eau Claire, Wis., will be ready to start manufacturing November 1, according to present plans. The first unit of the new factory is now completed, and the equipment and machinery is being installed. Ground has been broken for the office building, which will be 50 by 80 feet and conform to the outline of the factory.

Johnson Motor Co. Incorporates—The Johnson Motor Co., Fond du Lac, Wis., has changed from a partnership to a corporation which will bear the same name. The capital stock is $20,000 and the owners are F. A. Johnson, T. J. Wheaton and A. E. Knop. The company has just taken occupancy of a new garage building costing $15,000 and is dealer for the Interstate and Chalmers.

Metz Co. Makes Changes—The Metz Co., Boston, Mass., will take over a new building soon. The general sales will be conducted from the factory at Waltham until the new building is ready for occupancy. The Metz Co. has inaugurated a plan of closing its branches and substituting agencies.

Rafter Gets Winton Promotion—William A. Rafter, manager of the Milwaukee, Wis., branch of the Winton Motor Car Co., has been promoted to the position of manager of the northwestern branch at Minneapolis, Minn., and is succeeded at Milwaukee by Charles L. Davis, who has been handling eastern Pennsylvania and western new York for the Winton.

Chandler Company to Add—The Chandler Motor Car Co. has taken out a permit to build a four-story factory building at a cost of $125,000.

Hotel Owner to Have Garage—John Olle, Corliss, Wis., is building a public garage to be operated in connection with the Olle Hotel as a general garage and service shop.

Johns-Manville Opens New Branch—The H. W. Johns-Manville Co. has opened a new branch office at Great Falls, Mont., in charge of J. H. Roe. With this opening the company increases its branches to fifty-five.

Herschell-Spillman to Add—The Herschell-Spillman Co. has let contracts for the erection of an addition to its engine plant at North Tonawanda, N. Y. The building is to be 165 feet by 65 feet and four stories, and will permit a 25 per cent increase in production.

Hamilton Chief Engineer for Oakland—A. C. Hamilton, of the experimental department at the King Motor Co. plant in Detroit, has been appointed chief engineer for the Oakland Motor Co. to succeed Eric Wahlberg, who recently resigned to join the Nash organization at Kenosha.

Eldredge with Hood Service Bureau—Frank M. Eldredge has recently become associated with the Hood Service Bureau, of Detroit, in the capacity of director of the bureau's advertising and publicity divisions. Mr. Eldredge will continue his present connection with various industrial concerns as manager of their publicity departments.

New Stock for Springfield Body Co.—To provide funds for the construction of the company's new plant in Detroit, directors of the Springfield Body Co. have authorized the issue of 2,250 shares of preferred stock which are to be offered to the present stockholders at $110 and accrued dividends to the extent of 10 per cent of their present holdings. It is expected the new plant will be ready for use by January 1, 1917.

Webster Heads Racine Rubber Co.—Stuart Webster has been elected president of the Racine Rubber Co., Racine, Wis., manufacturer of tires and tubes, to fill the vacancy caused by the resignation of H. L. McClaren, who recently resigned as president of this company and also of the Mitchell Motor Corp., of Racine, the ownership of which is closely allied with the tire company. Mr. Webster was one of the original officers of the tire company, which was established in March, 1910. In 1915 he was elected vice-president and general manager. This position has been turned over to Louis T. Vance, who has been factory manager since 1911. H. C. Severance remains as secretary and general sales manager. The office of treasurer is combined with that of president.

Giesel Returns to Federal—A. A. Giesel, after an absence of 3 years, returns to the Federal Motor Truck Co. as its New England sales manager.

Auburn Automobile Co. Adds—Work has been started on a four-story building for the Auburn Automobile Co., Auburn, Ind. The contract calls for its completion November 1.

Accessory Dealers Build—Reinhard Bros. Co., Minneapolis, Minn., large dealer in accessories, will have a new building which will be ready February 1 and will cost $75,000. It is to be four stories and basement with foundation to carry eight stories eventually.

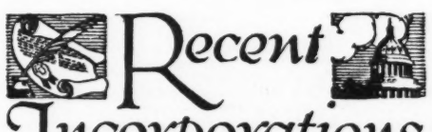
Garage Owners Organize—Garage owners of Gary, Ind., perfected an organization last week to better garage conditions and to eliminate bad accounts by placing business on a cash basis. Officers elected are: President, Gerrit Verplank; treasurer, R. V. Hoover, and secretary, Paul Hood.

Stanley Joins Briscoe Corp.—John L. Stanley has been appointed assistant sales manager of the Briscoe Motor Corp. of Jackson, Mich. Mr. Stanley was formerly with the Paige distributors at Kansas City and prior to that time was with the Mitchell & Jeffry Co. as district sales manager.

Wilson Gets Redden Territory—C. Edward Wilson, at present Detroit manager for the Redden Motor Truck Co., has been given Michigan and other territory for the Redden trucks. Mr. Wilson, who was formerly originator and conductor of the motor races at Savannah, Ga., is taking over the garage now conducted next door to the Redden company's offices and shops.

Auctioneer to Run Garage—R. W. Hipple, a Wagner, S. D., auctioneer, has let the contract for a brick garage to be completed this fall. It will contain 10,000 square feet of floor space and will be equipped with modern machinery and steam heated. Clark Thompson, mechanic and electrician, is a partner and will have complete charge of the mechanical department.

New Casting Company Builds—The Osborne Casting Co., Racine, Wis., is a new concern which is establishing an iron foundry to cater to manufacturers of motor car engines and complete cars. The backers are John H. Osborne and Charles G. Holmes, experienced foundrymen. More than $20,000 is being expended in the erection and equipment of the foundry, which will be ready for operation on or before January 1. Forty to fifty men will be employed at the start.



Albany, N. Y.—Automobile Crankshaft Corp., to manufacture motor cars, aeroplanes and tractors; capital stock, $325,000; incorporators, J. M. Hibbard, E. E. McCrone, W. C. Rice.

Albany, N. Y.—Colonial Tire & Rubber Co.; tires, rubber goods; capital stock, $20,000; incorporators, L. H. Henry, A. F. White, J. A. Crockett.

Albany, N. Y.—Larry-Well Co.; motor cars, accessories, supplies, garages; capital stock, $5,000; incorporators, A. J. Volmer, L. F. Bargebuhr and J. B. Well.

Albany, N. Y.—Miller Carbureter New York Corp.; machinery, motors, motor cars, etc.; capital stock, $10,000; incorporators, B. W. Morse, C. W. Rundlett and G. Morris.

Austin, Tex.—Lamar Motor Co. of Paris; capital stock, $7,500; incorporators, J. E. Osborne, G. H. Hoyes and E. T. Hutson.

Bucyrus, O.—Ohio Happy Farmer Tractor Co.; capital stock, $20,000; to manufacture farm tractors; incorporators, H. H. Lehman, L. A. Shaeffer, E. Eich, R. D. Demmer and F. W. Wiedmayer.

Buffalo, N. Y.—Harvey Top & Body Co., to manufacture motor cars, tops, bodies, etc.; capital stock, $20,000; incorporators, L. G. Smith, Henry C. Harvey and H. B. Harrison.

Cleveland, O.—Cleveland Clutch Co.; capital stock, $10,000; to manufacture clutches for motor cars and motorcycles; incorporators, C. A. Morris, Harold T. Clark, C. C. Owens, Ernest Andell and Sterling Newell.

Cleveland, O.—L-G Motor Co.; capital stock, $10,000; to sell motor cars and supplies; incorporators, David Klein, Marie Rauer, Margaret Appelby, Joseph Schaeffers and Louis H. Wieber.

Cleveland, O.—Hal Motor Car Co.; capital stock, $1,000; to sell motor cars and supplies; incorporators, Thomas H. Jones, Leslie Nichols, William L. David, W. T. Kinder and Gardner Abbott.

Cleveland, O.—Woodhill Garage Co.; capital stock, $5,000; to operate a garage; incorporators, C. J. Buckley, L. A. Kujawaki, W. R. Winn and F. M. Bell.

Columbus, O.—Shilling Automobile Bumper Co.; capital stock, $100,000; to manufacture a safety device to prevent motor cars from turning turtle when an accident happens; incorporators, E. C. Shilling and Jacob Dagger.

Frankfort, Ky.—Gus Edwards Motor Sales Co.; capital stock, $5,000; incorporators, G. W. Katterjohn, A. G Edwards and Mrs. Maud Katerjohn.

New York—Premier Garage; motors, machines, garage; capital stock, $10,000; incorporators, J. W. Gottlieb, T. F. Quinn.

Philadelphia, Pa.—Orrville Rubber Co.; to manufacture and sell motor car tires, tubes and other accessories; capital stock, $125,000; incorporators, Morgan Howells, E. B. Cornell and E. A. Homeler.

Philadelphia, Pa.—Sweeten Wilmington Co.; to manufacture, sell and repair motor cars; capital stock, $25,000; incorporators, H. E. Latter, N. P. Coffin and C. M. Egner.

Red Hook, N. Y.—Ford Sales Co.; motor cars; capital stock, $7,000; incorporators, Z. D. Patterson, M. Rackham, H. H. Rackham.

Richmond, Ind.—Talcott-Overland Co.; motor cars and accessories; capital stock, $10,000; incorporators, C. C. Talcott, H. J. Steinkamp, William Wessel, B. C. Robbins and Will W. Reller.

Sandusky, O.—Kappus Auto Co.; capital stock, $10,000; to sell motor cars and supplies; incorporators, Will C. Appell, Fred C. Kappus, E. L. Kappus, E. P. Appell and C. Appell.

Tacoma, Wash.—American Automobile Co.; capital stock, $10,000; incorporators, W. W. King and W. H Pratt.

Toledo, O.—Studebaker Sales Co.; capital stock, $500,000; to sell motor cars and supplies; incorporators, R. M. Schrod, E. C. Spader, Louis A. Luckmeier, Vernon H. Burke and N. H. Ficht.

Trenton, N. J.—Broadway Tire & Supply Co., to manufacture and deal in motor cars and accessories; capital stock, $25,000; incorporators, A. Smith, C. R. Bogart, F. Cohen.

From the Four Winds

CAR Climbs Chinese Wall—The Forbidden City of Pekin, China, is not half so forbidden since a Hupmobile carrying five passengers climbed the Tartar city wall. For centuries only military guards have watched from its top, 50 feet above the ground and 40 feet wide. A permit had to be obtained from the Chinese government.

Drives Car 250,000 Miles—T. B. Orr, Bakersfield, Cal., has run his car, a Ford, 250,000 miles, since he bought it less than 6 years ago. One trip that helped pile up this score was 2,160 miles long and was made after the 200,000 mark had been passed. On that trip, no stop for repairs was necessary during the 11 days required to finish it.

Phoenix Requires Dimmers by Law—An ordinance requiring the use of dimmers on motor car headlights and requiring all drivers of motor vehicles to stop behind standing street cars has been adopted by the Phoenix, Ariz., commission under the emergency clause and is now in effect. The commission's action followed a series of accidents said to be due to the blinding glare of headlights.

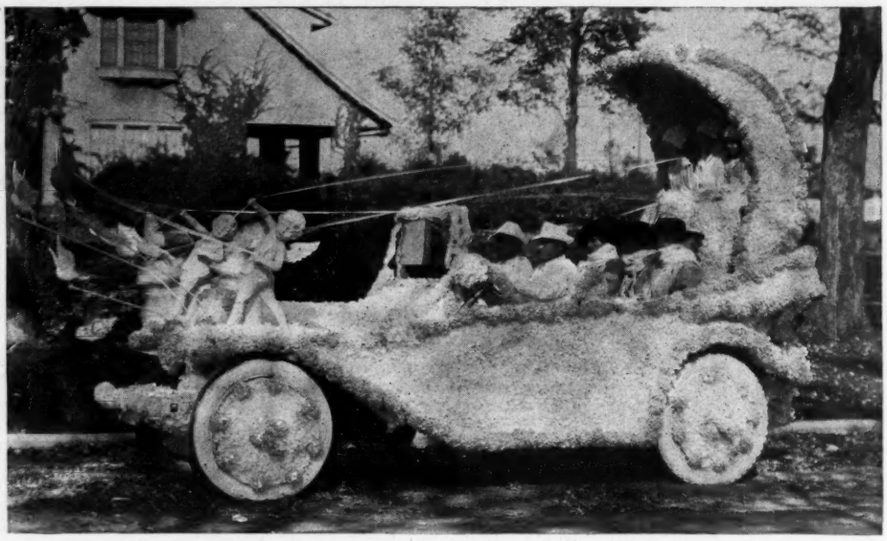
Rapid Transit for Troops—In a test of the mobility of motor cars, made recently on the border, 128 motor trucks transported the First and Second Kansas regiments, which had been stationed at Eagle Pass, to San Antonio in 32 hours' running time. It is 200 miles from Eagle Pass to San Antonio, and to march the men that distance would have required 2 weeks, while cavalry would have taken 1 week. The troops were met on their arrival by General Funston, Colonel H. L. Rogers, chief quartermaster for the southern division, and other officers who planned the test of motor equipment.

Trucks Help Stock Game Preserve—Motor trucks were utilized in a new line of service recently when they were converted into traveling pens for wild animals and used to haul eighteen head of buffalo, deer and elk from the city park corrals to the 240-acre game preserve at Genesee Park, 25 miles west of Denver, in the municipal mountain park system of the foothills. The animals were hauled over Lookout Mountain, where the grades run to 6 per cent or a trifle higher and where the road reaches points half a mile higher than Denver. There are now sixty-four animals in this game preserve, which is a big attraction for motorists.

With the Motor Clubs

Colorado Club Posts Roads—More than 500 miles of Colorado motor roads have been signboarded this year by the Denver Motor Club in several installments of work. The club had posted some of the roads before and the signs had been destroyed, but much work was done along roads recently developed for motor travel. Some of the signs reach scenic points 100 miles from Denver.

Missouri Club Meets at Fair—The state fair meeting at Sedalia, Mo., for the purpose of forming a Missouri Automobile Association drew a fair representation of club delegates. C. C. Kelley was elected temporary president and S. E. Spencer temporary secretary. Both are of Sedalia and will attend to details of incorporation. The purposes of the association are to be: To direct state legislation; to bring about uniform regulations in various cities, and to direct road work. The federal aid will enable six cross-state macadam highways to be built in 5 years. The association will also try to obtain legislation as to expending license fees, which are making one of the largest state funds, and to promote statewide anti-theft work.



SOUTH BEND CELEBRATES—South Bend, Ind., thus celebrated the 100th anniversary of the admission of Indiana into the Union. Three days were given over to parades, receptions, concerts and in the evenings to the historical pageant presented by 5,000 people at Springbrook park. The second day's parade was for motor cars, in which 150 decorated machines took part in a contest for loving cups given by the centennial association and by several agencies.

Nebraska Club Starts Campaign—The Nebraska State Automobile Association wants 10,000 members and is starting a campaign for that purpose. At least 5,000 are to be obtained before the coming session of the state legislature. Nebraska has 100,000 cars. Six years ago the association was made up of forty local clubs and several thousand members, but interest was lost temporarily. The association is affiliated with the American Automobile Association and will work for good roads, legislation and the cutting down of the number of car thefts.

Coming Motor Events

RACES

—1916—

October 19—Indianapolis speedway race.
October 21—Track meet, Kalamazoo, Mich.
*October 28—Harkness Trophy, New York Speedway.
*November 16—Vanderbilt cup race, Santa Monica, Cal.
*November 18—Grand prize race, Santa Monica, Cal
*November 30—Speedway, Los Angeles, Cal.
*December 25—Speedway, Los Angeles, Cal.

—1917—

May 19—Metropolitan Trophy, New York speedway.
†May 30—Indianapolis speedway.
†June 9—Chicago speedway.
June 23—Cincinnati speedway
†July 4—Omaha speedway.
†July 14—Des Moines speedway.
†July 28—Tacoma speedway.
August 4—Kansas City speedway.
†September 3—Cincinnati speedway.
†September 15—Providence speedway.
†September 29—New York speedway.
October 6—Kansas City speedway.
October 13—Chicago speedway.
October 27—New York speedway.

* Sanctioned by A. A. A.
† A. A. A. championship events for 1917.

MEETINGS

January 9-11—Mid-winter meeting, Society of Automobile Engineers.

SHOWS

October 14-21—Pittsburgh, Pa.
October 14-31—Dallas, Tex.
October 15-November 1—Omaha, Neb., closed car salon.
January 6-13—New York show.
January 13-20—Montreal.
January 27-February 3—Chicago show.
February 18-25—St. Louis, Mo., show.
February 26-March 3—Omaha, Neb., show.
March 3-10—Boston.
March 6-10—Fort Dodge, Ia., show.

Good Roads Activities

County Good Roads Day—Milwaukee, Wis., is to have a Good Roads day October 21, and 25,000 buttons have been or will be distributed to proclaim the occasion. More than 2,000 cars were in line in the parade a year ago. The highway and bridge committee of the board of supervisors is boosting the event.

Wants $10,000,000 Roads Money—The next Illinois assembly will be asked to appropriate $10,000,000 for roads, according to a resolution made by the Egyptian Trail Association at its meeting at Mattoon, Ill., recently. A petition is to be agitated by the association in co-operation with the National Trade Association and the Lincoln Highway in Illinois for the purpose of persuading the assembly to approve the issuing of bonds in that amount.

Pennsylvania Wants License Money—Pennsylvania license money is at present placed in the general fund, and Washington county wants it to be applied directly to building good roads. For this reason a mass meeting was held in the town hall at Washington recently and committees were appointed to make road plans to submit at later meetings. One idea for getting road money was suggested for taxing each bushel of coal mined.